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Lee et al.

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(45) **Date of Patent: *Mar. 11, 2025**

(54) **PORTABLE HOOD**

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(73) Assignee: **LG ELECTRONICS INC.**, Seoul (KR)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 412 days.

This patent is subject to a terminal disclaimer.

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(30) **Foreign Application Priority Data**

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(51) **Int. Cl.**
F24C 15/20 (2006.01)

(52) **U.S. Cl.**
CPC ***F24C 15/2078*** (2013.01)

(58) **Field of Classification Search**
CPC F24C 15/2078; F24C 15/2092
USPC 454/63
See application file for complete search history.

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Primary Examiner — Allen R. B. Schult
(74) *Attorney, Agent, or Firm* — KED & ASSOCIATES

(57) **ABSTRACT**

A portable hood may include a base, a head, a column, and a fan. The head may introduce air thereinto and discharge the introduced air to the outside. The column may be coupled eccentrically to a side of the head in a horizontal direction. Further, the fan may be located inside of the head such that the fan is eccentric to the head toward the column.

19 Claims, 33 Drawing Sheets

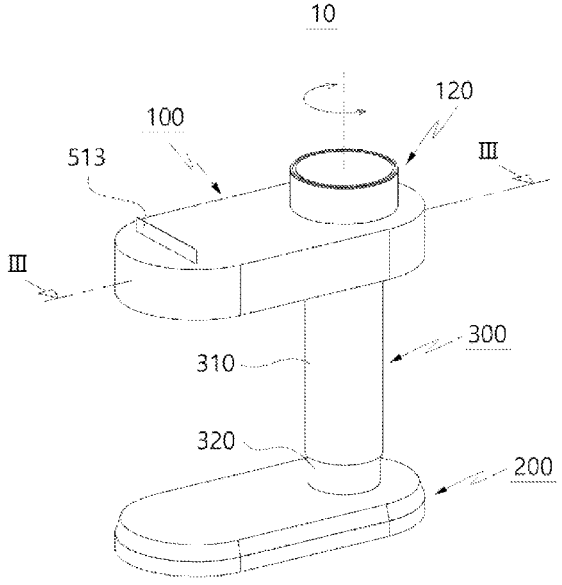

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FIG. 1

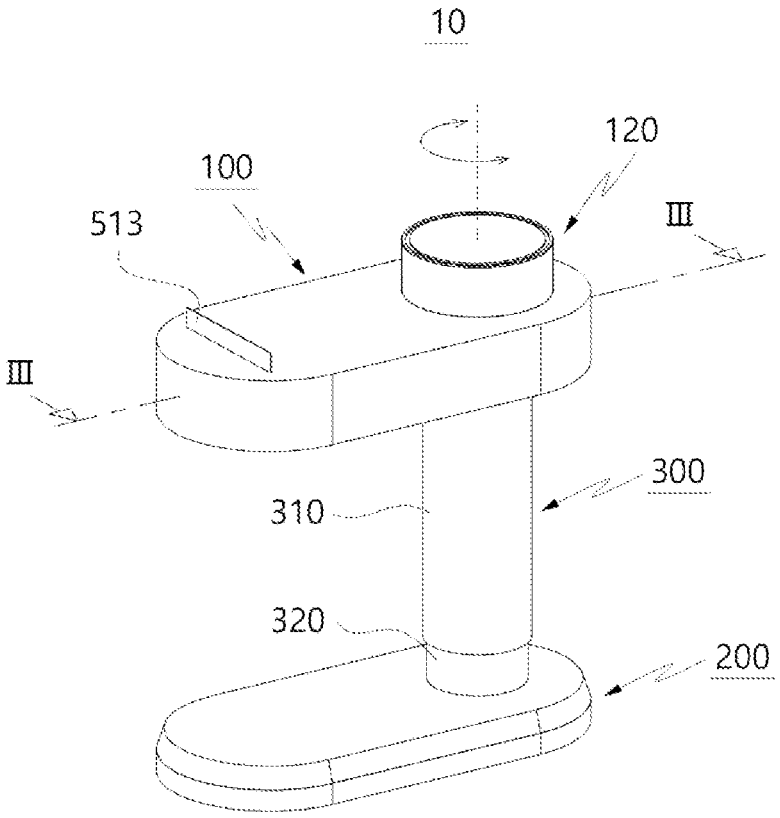

FIG. 2A

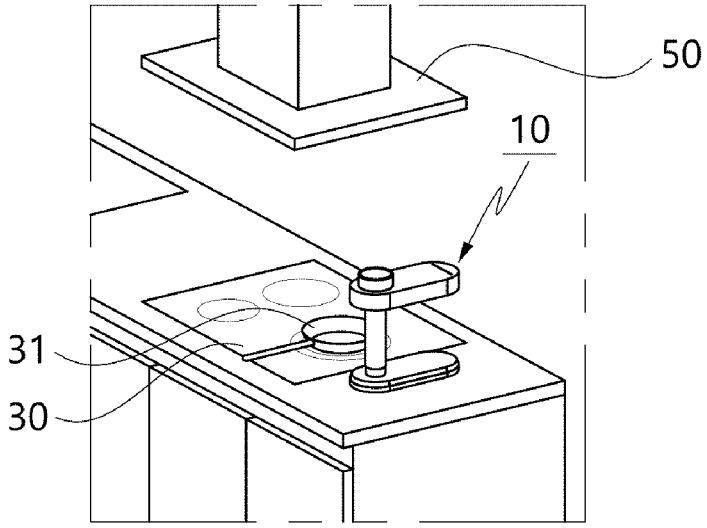

FIG. 2B

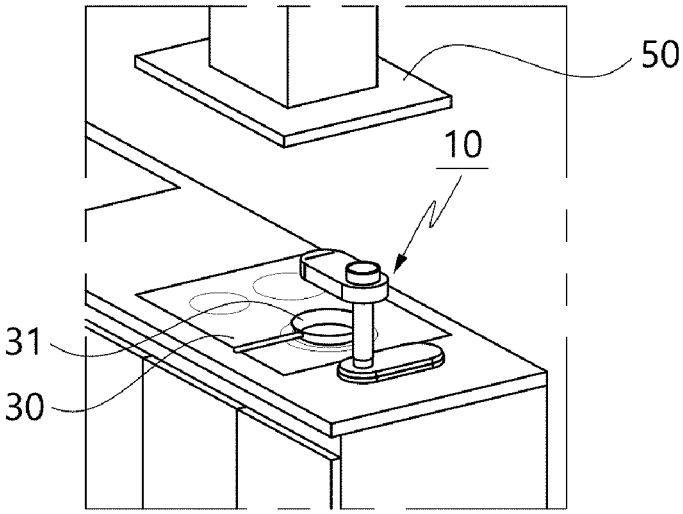

FIG. 2C

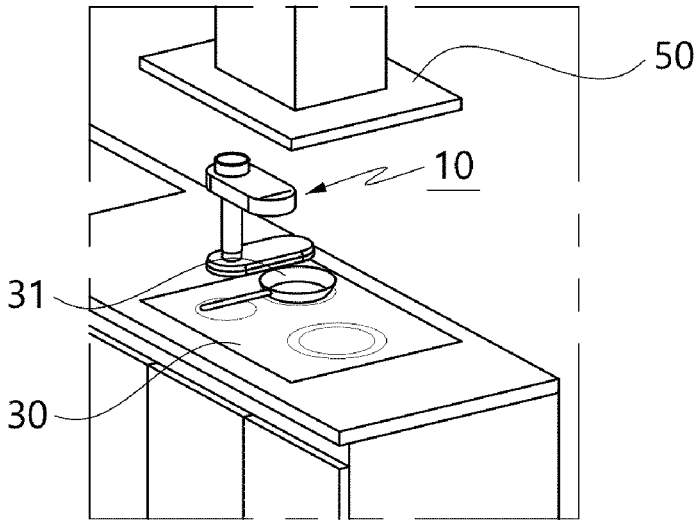
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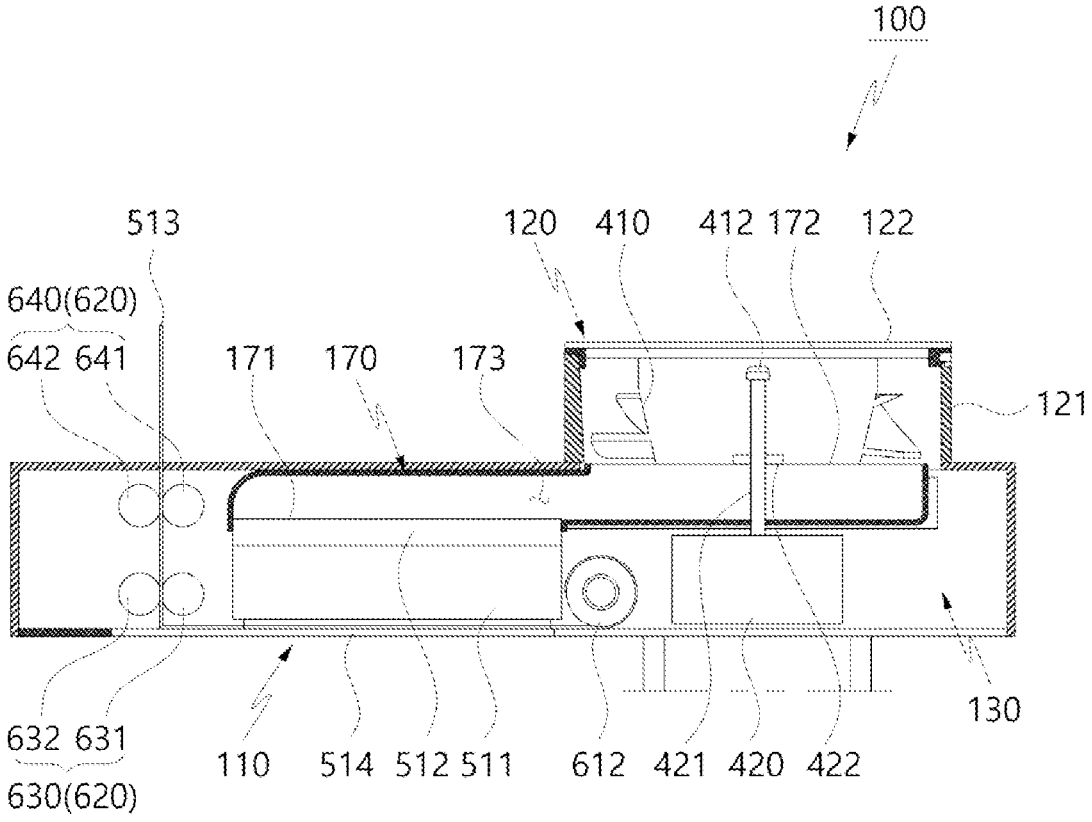
FIG. 3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422
130

FIG. 4

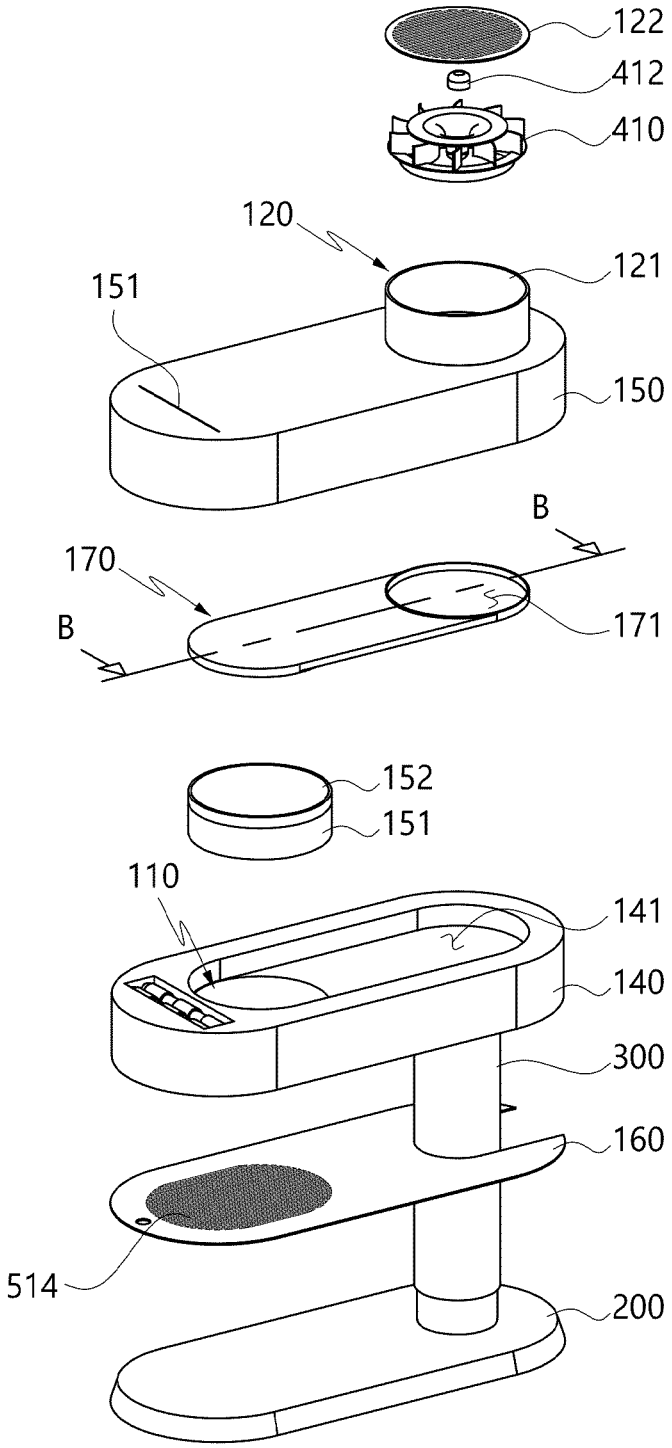
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FIG. 5

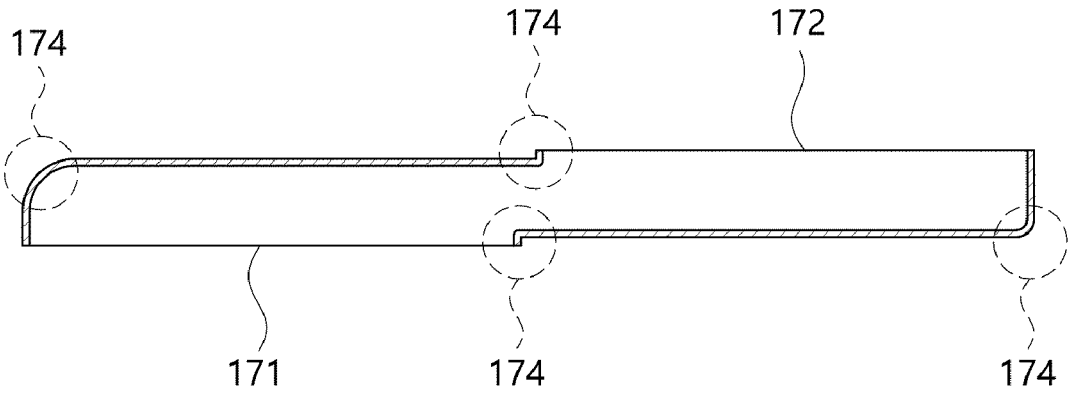


FIG. 6

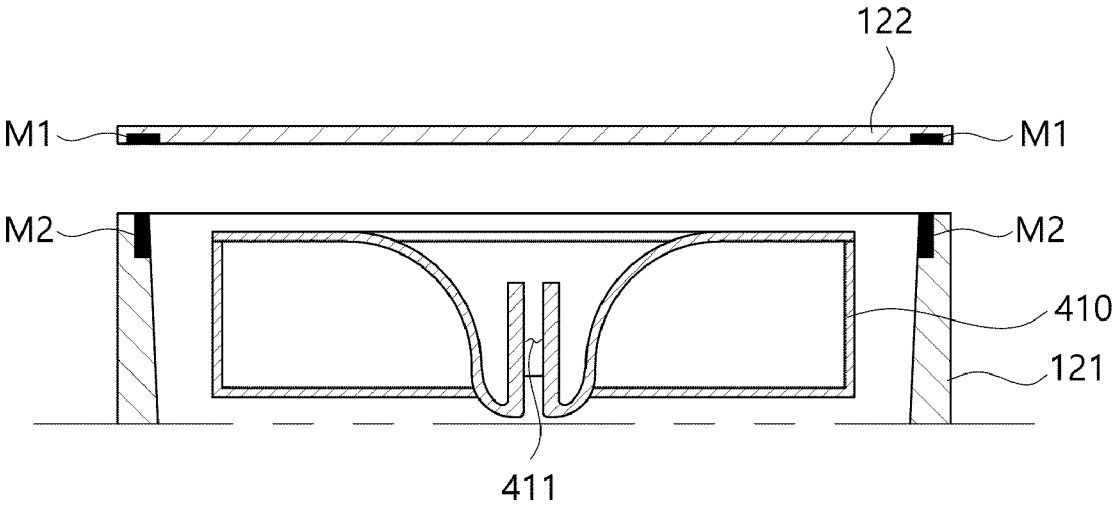


FIG. 7

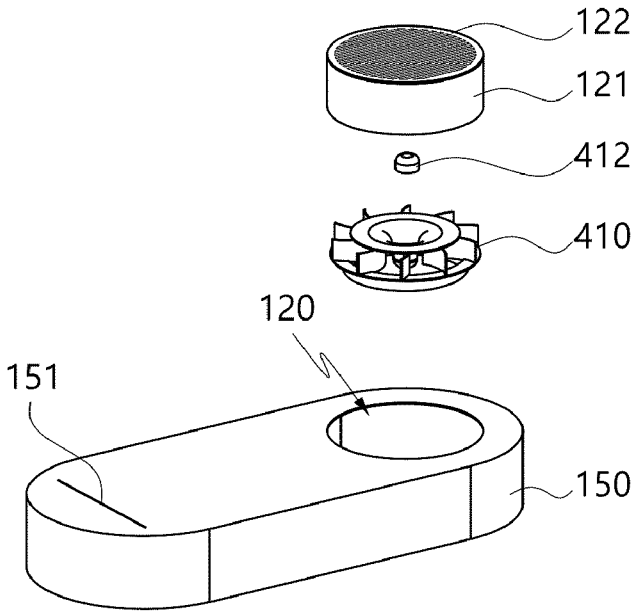


FIG. 8

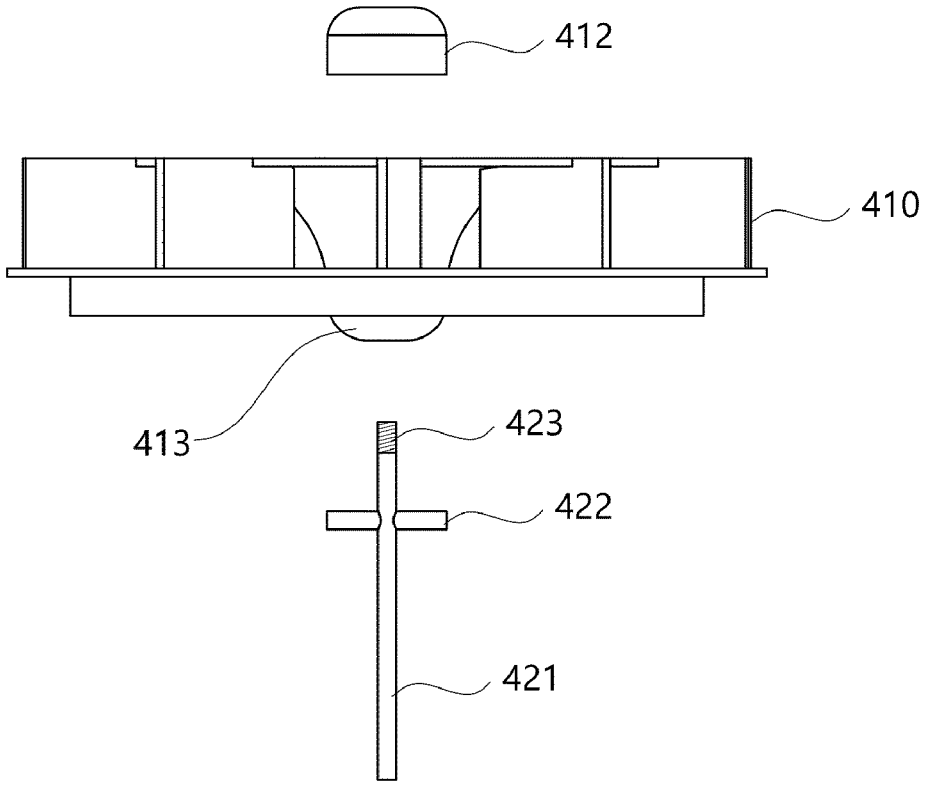


FIG. 9

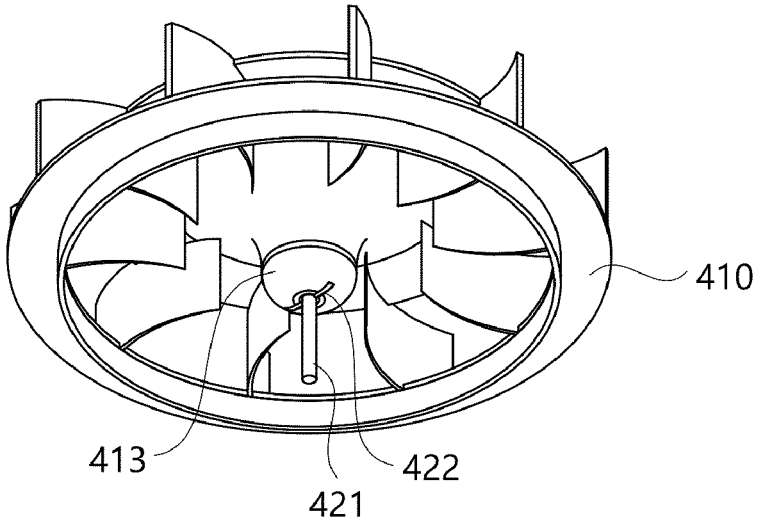


FIG. 10

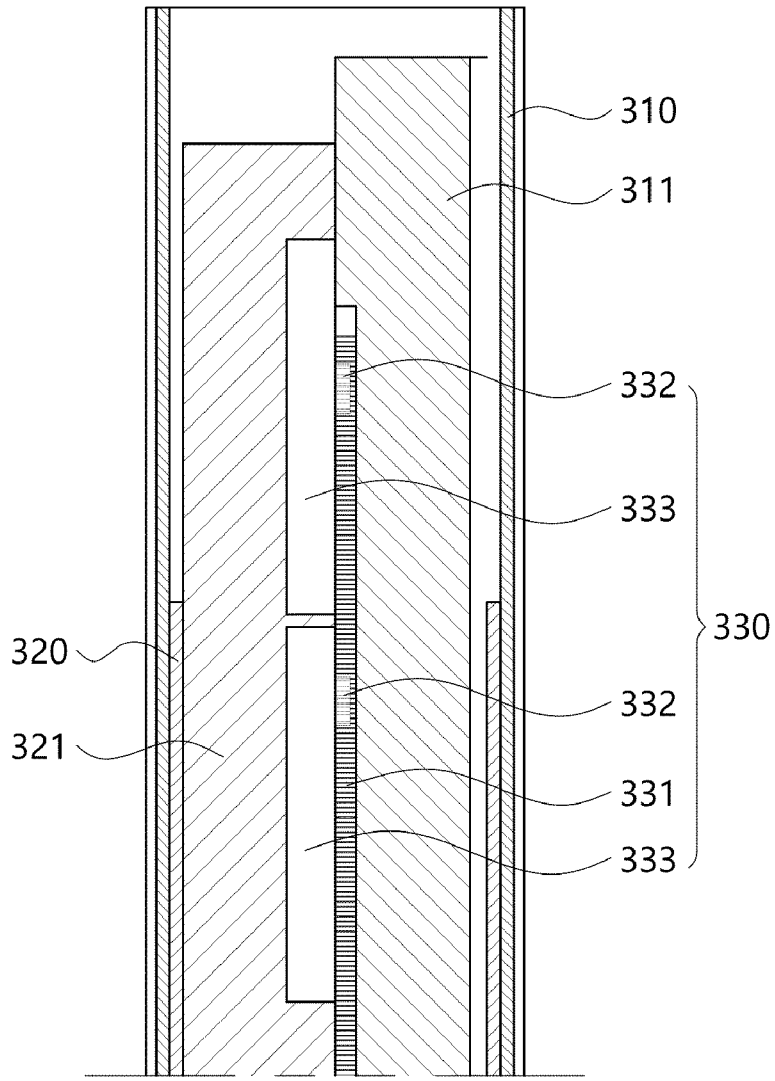


FIG. 11A

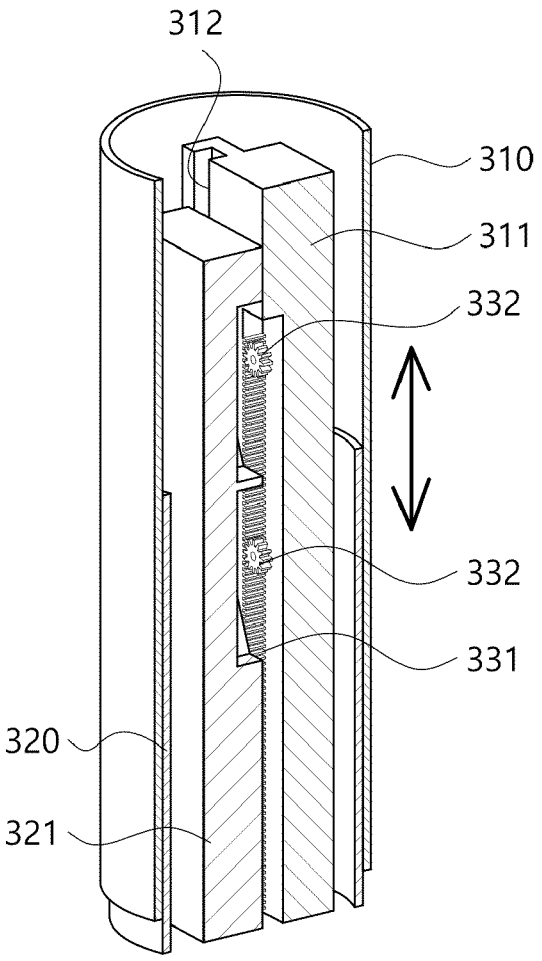


FIG. 11B

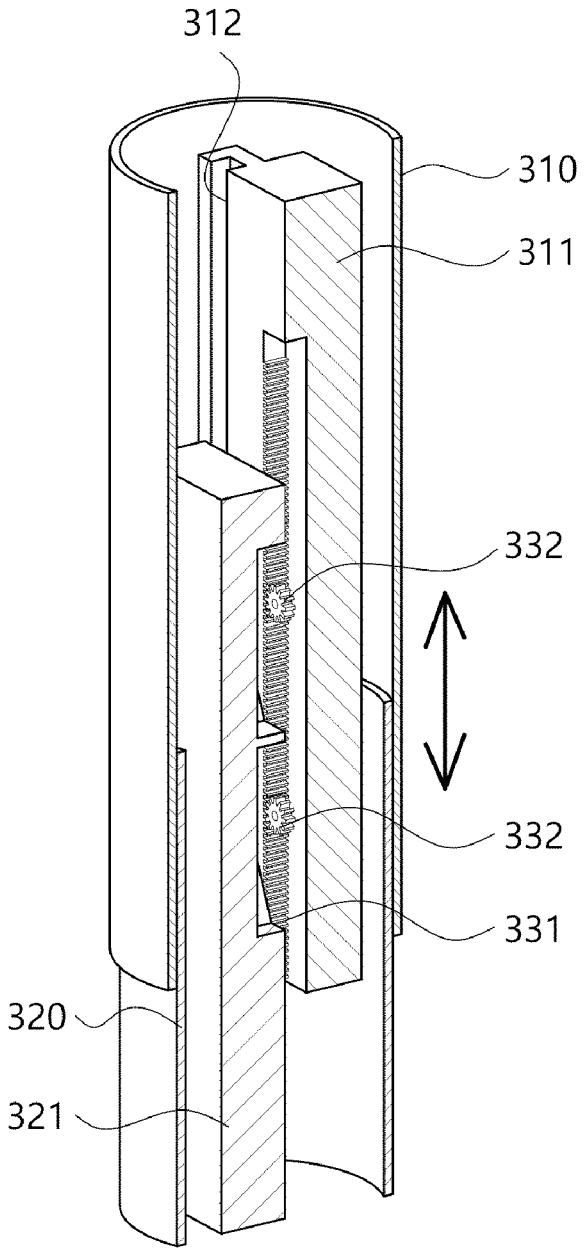


FIG. 12

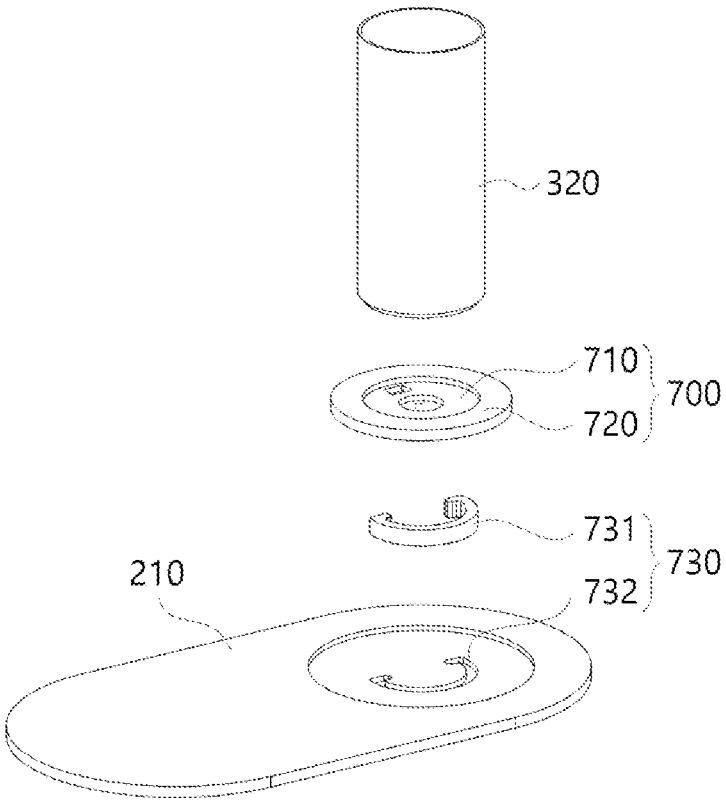


FIG. 13

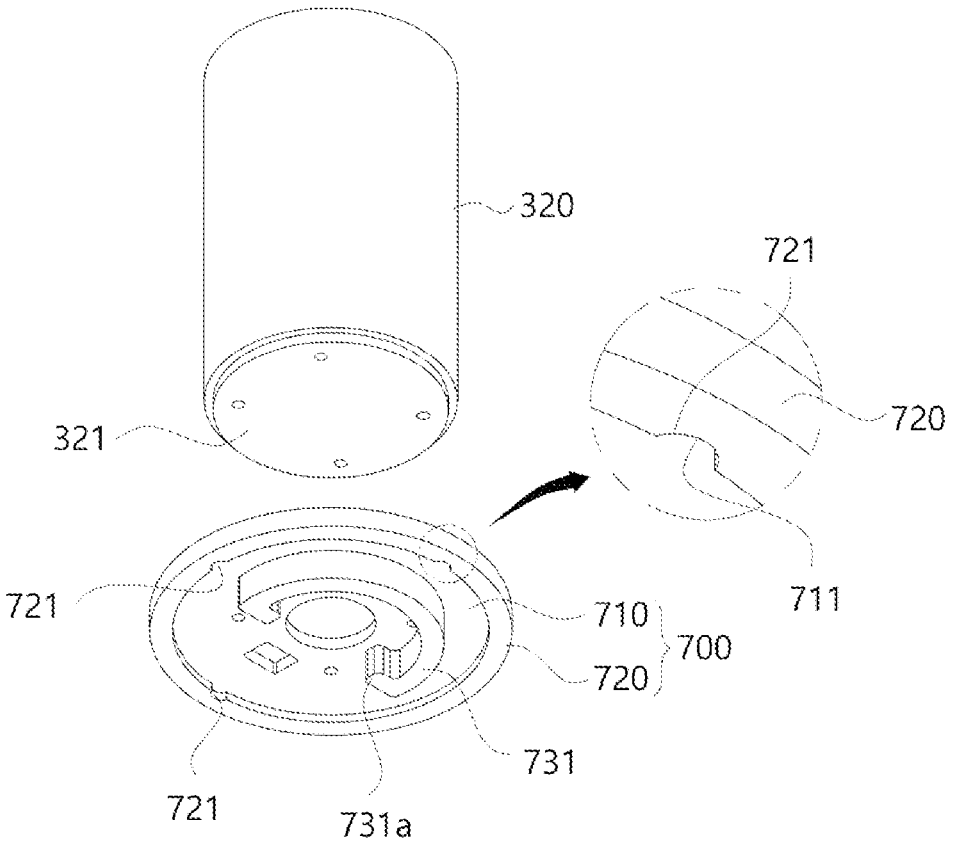


FIG. 14

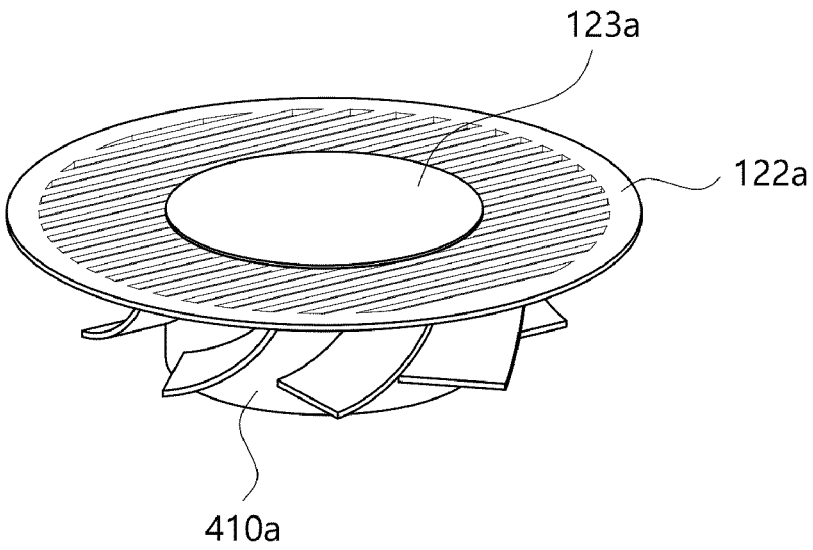


FIG. 15

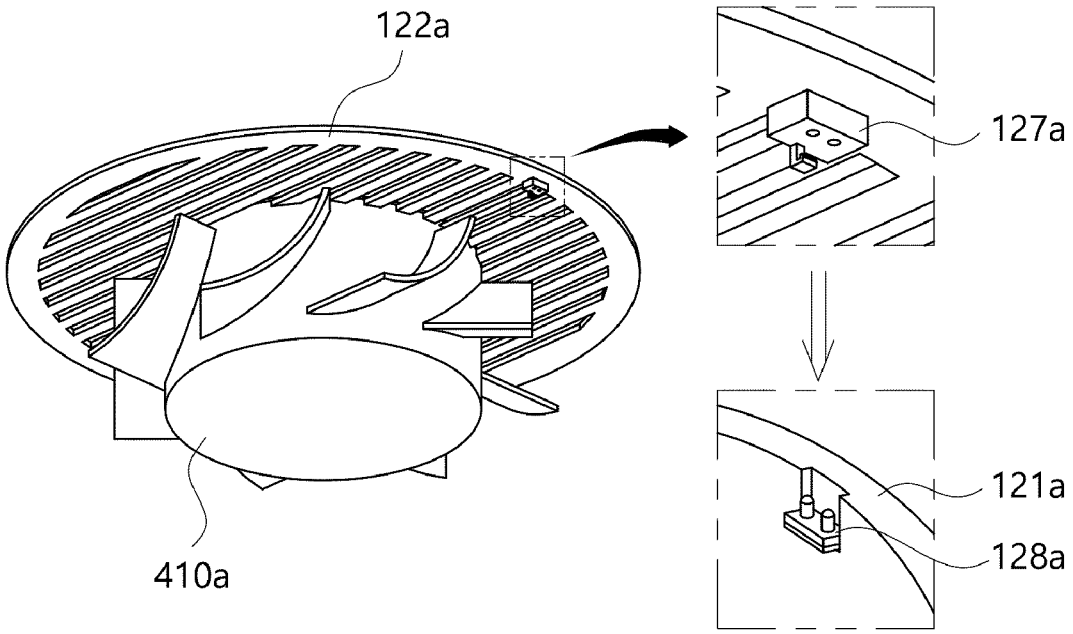


FIG. 16

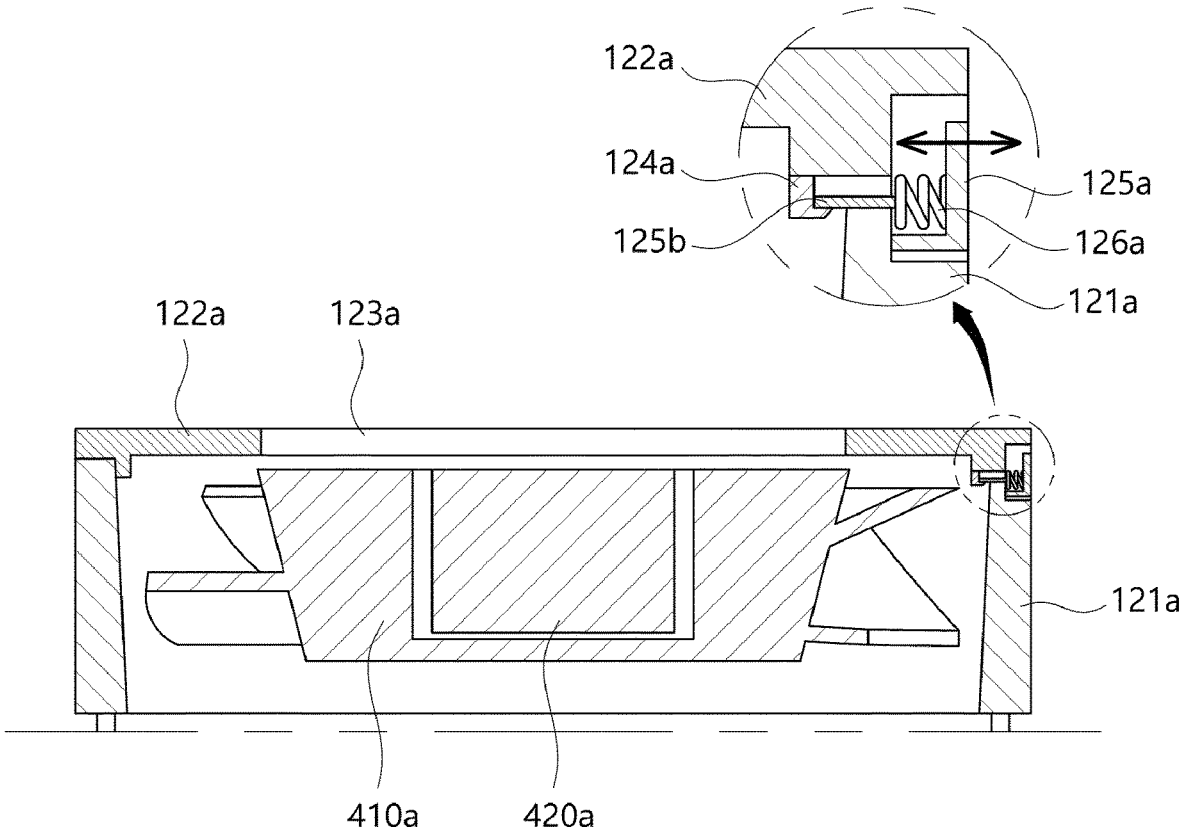


FIG. 17

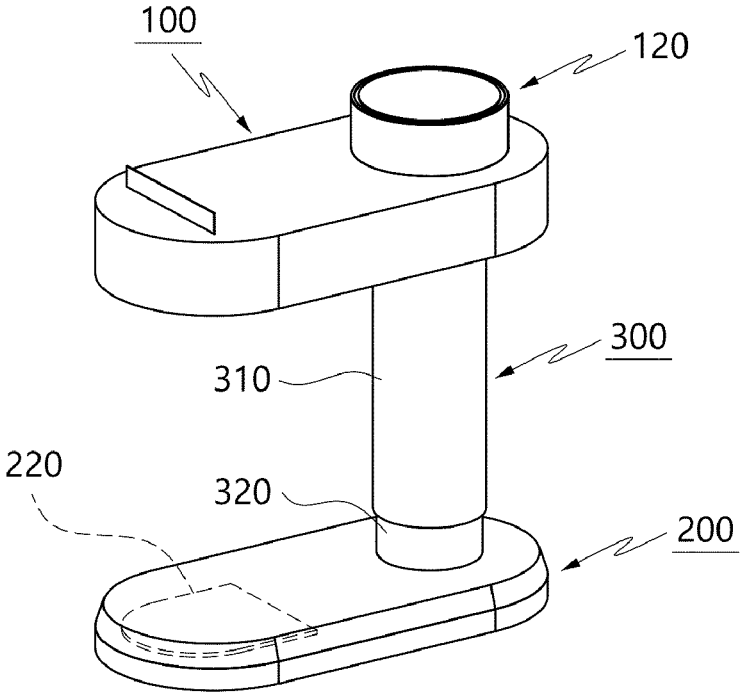


FIG. 18A

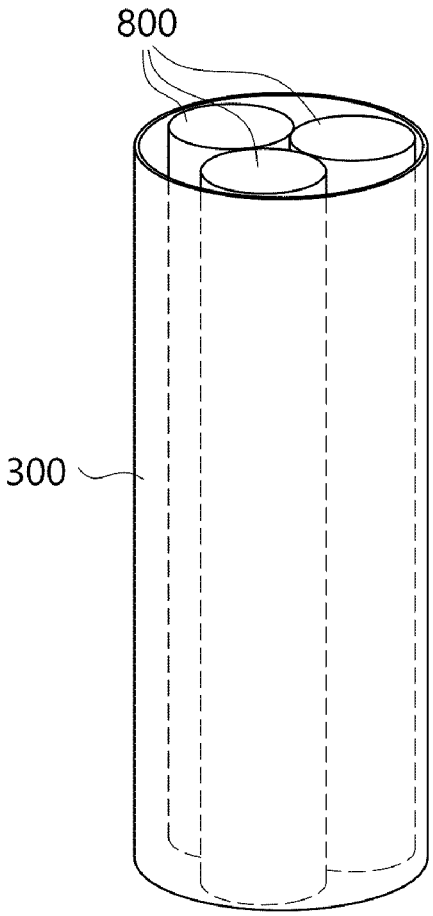


FIG. 18B

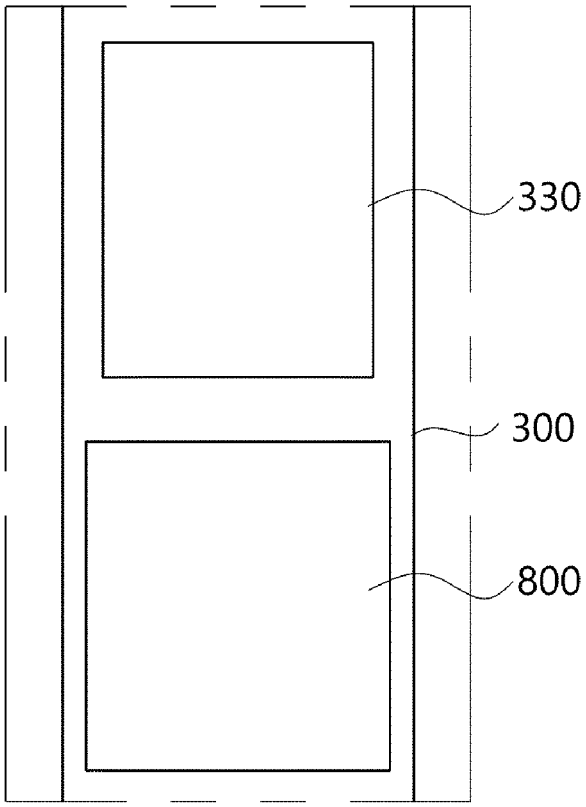


FIG. 19

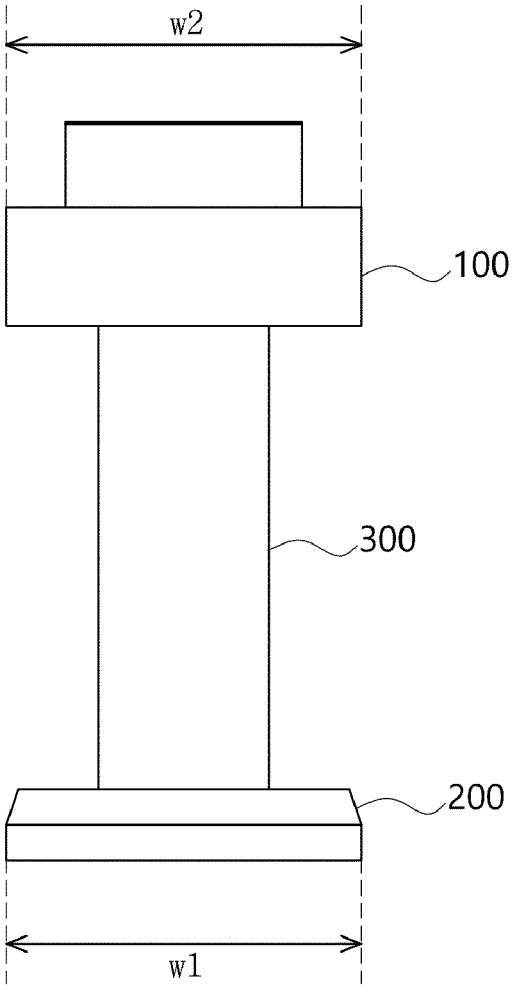


FIG. 20

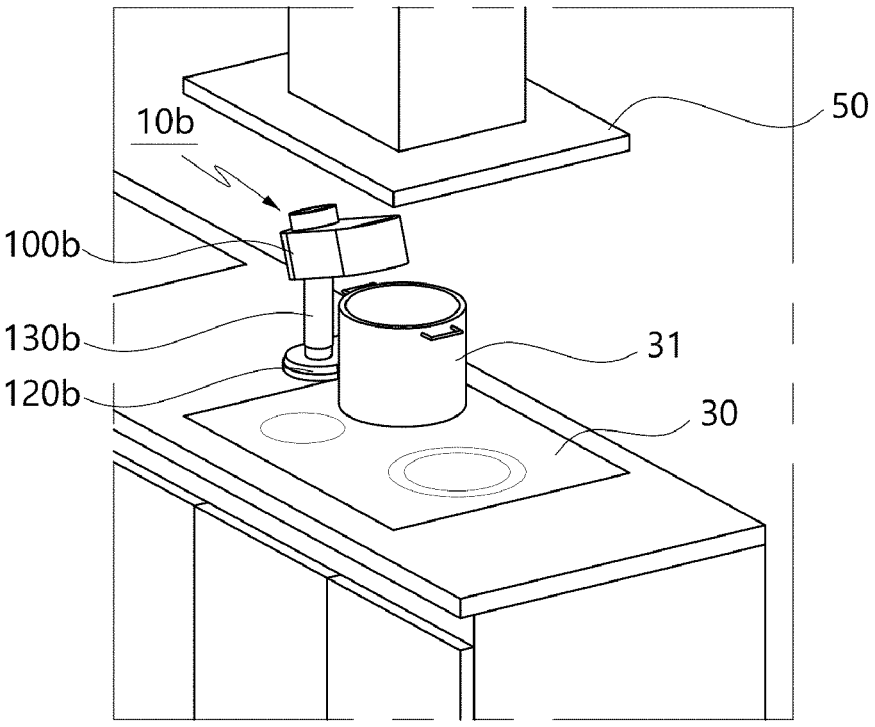


FIG. 21

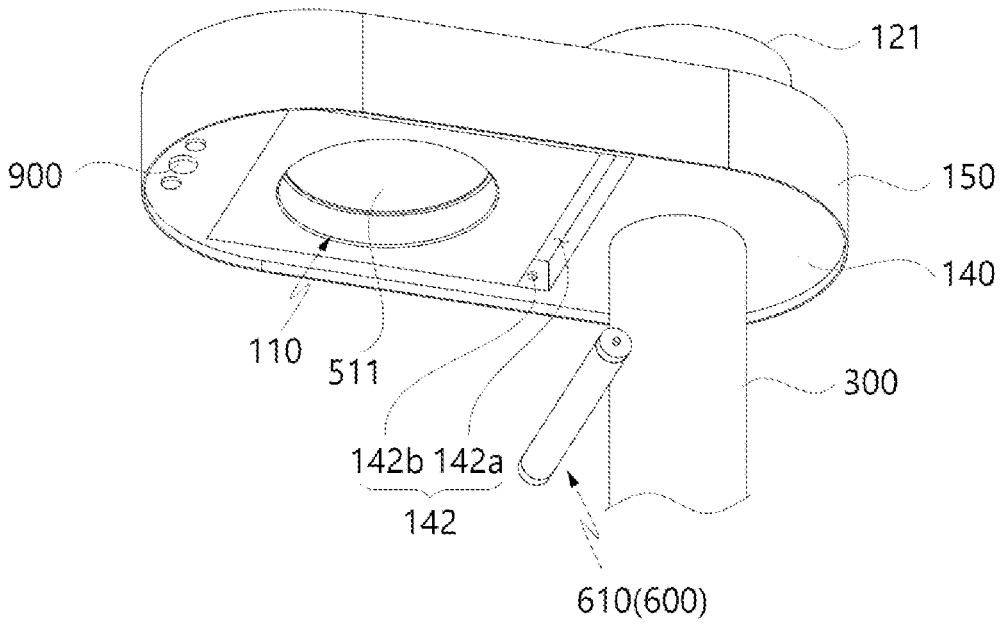


FIG. 22

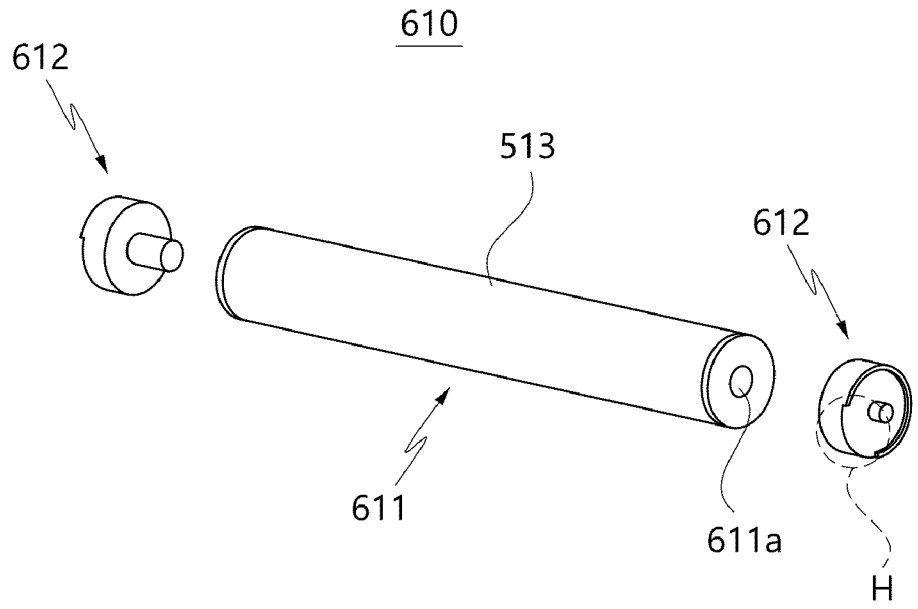


FIG. 23A

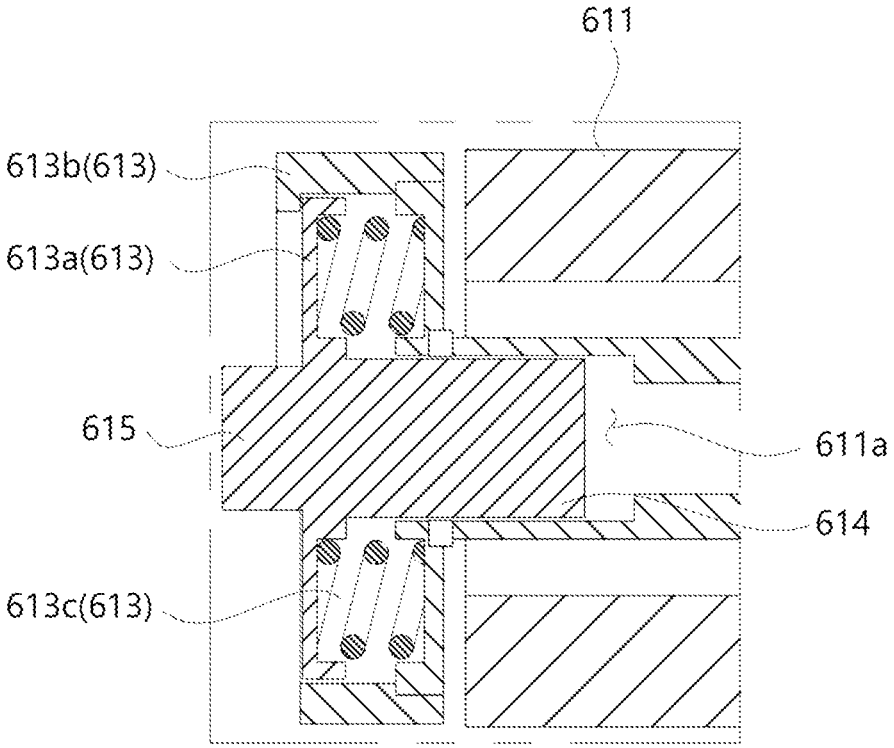


FIG. 23B

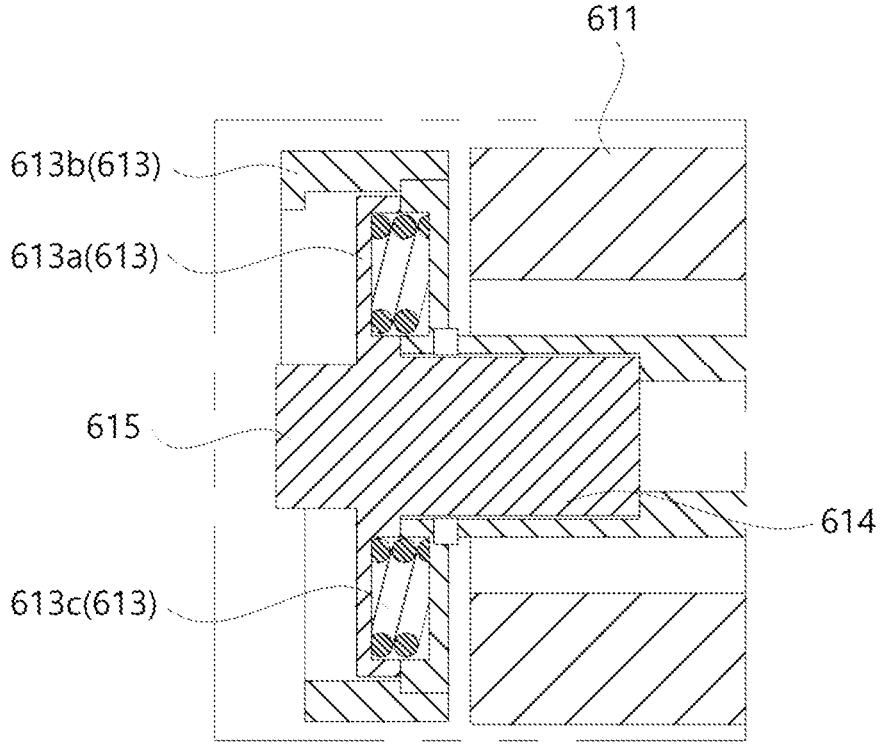


FIG. 24

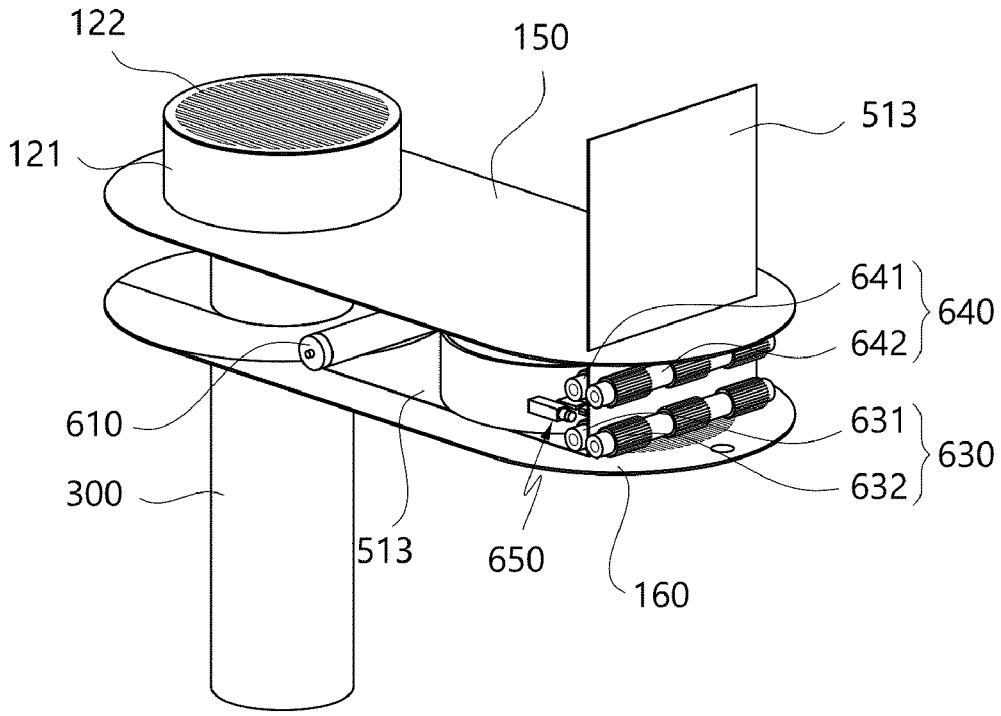


FIG. 25

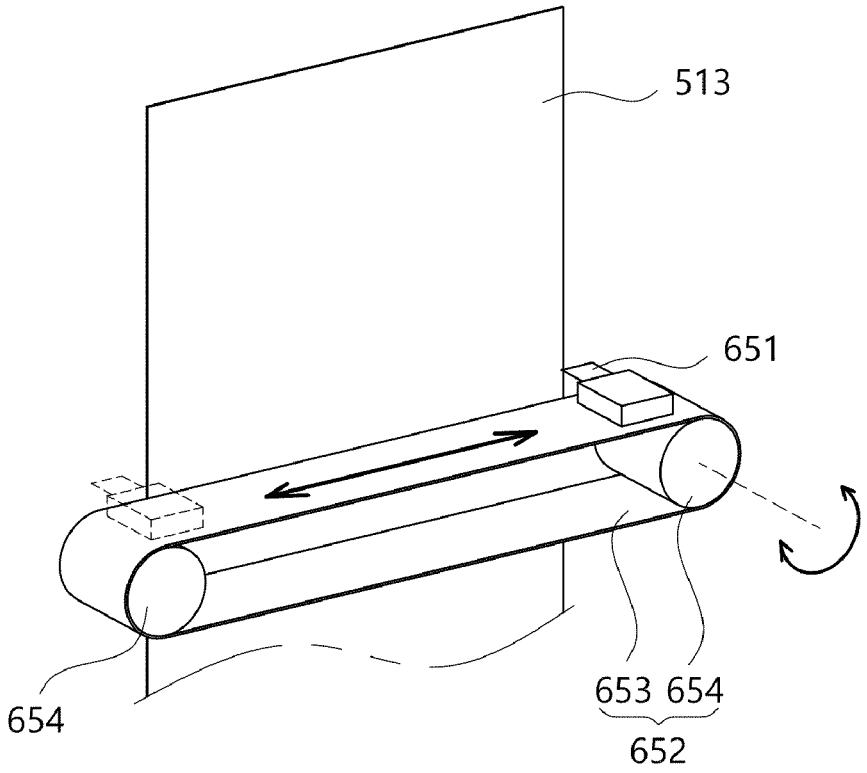


FIG. 26

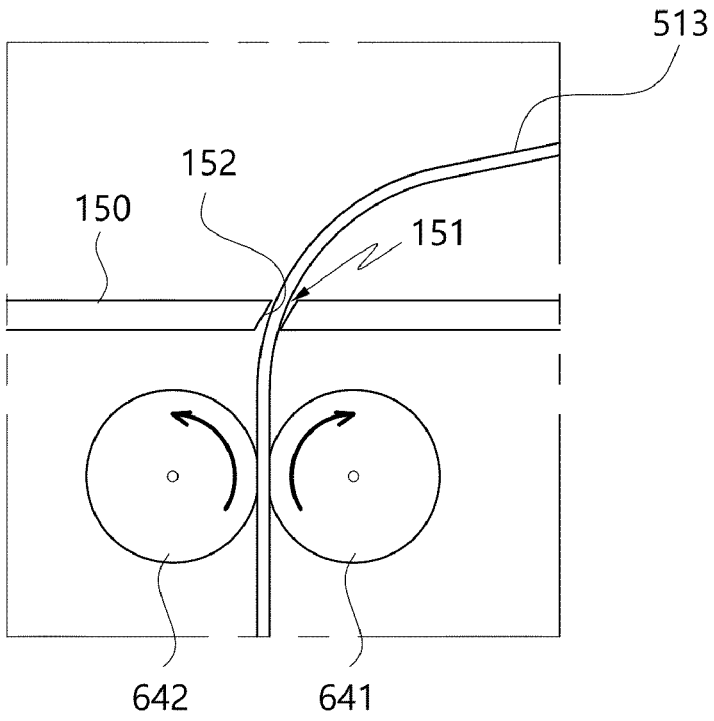


FIG. 27

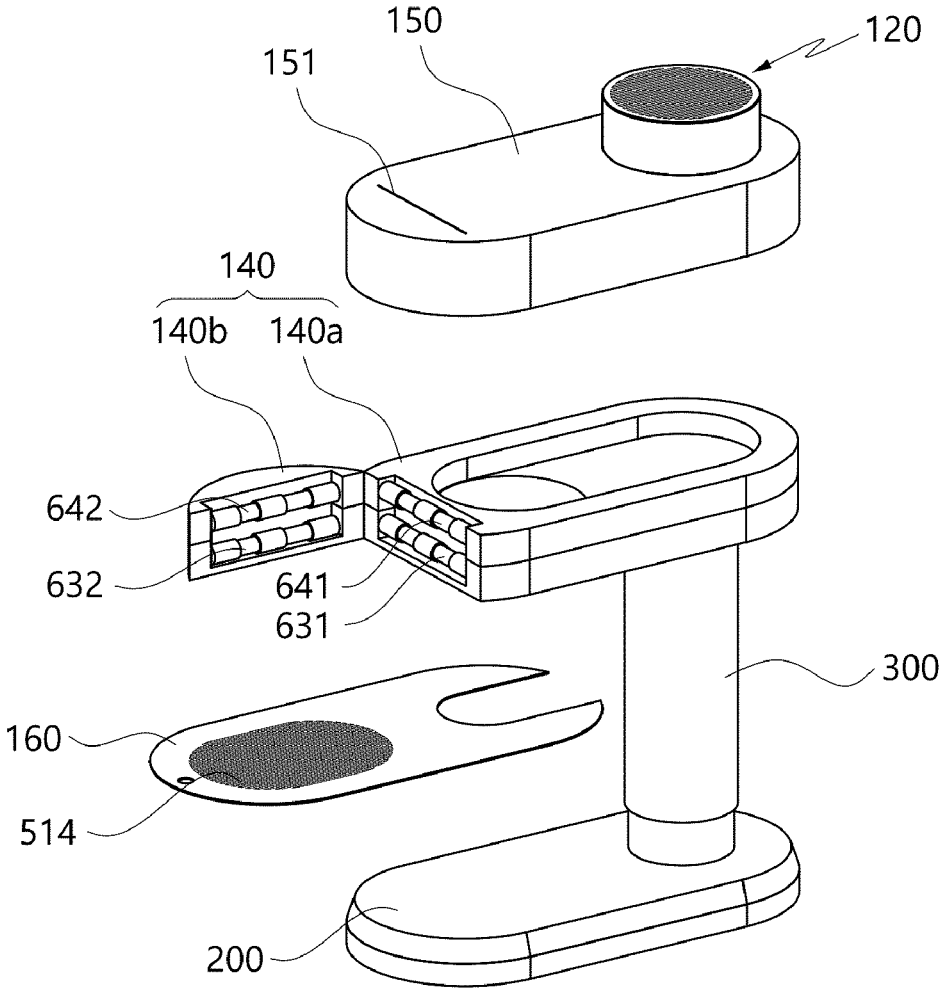


FIG. 28A

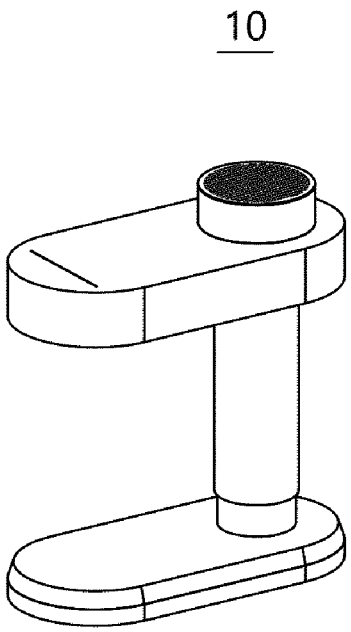


FIG. 28B

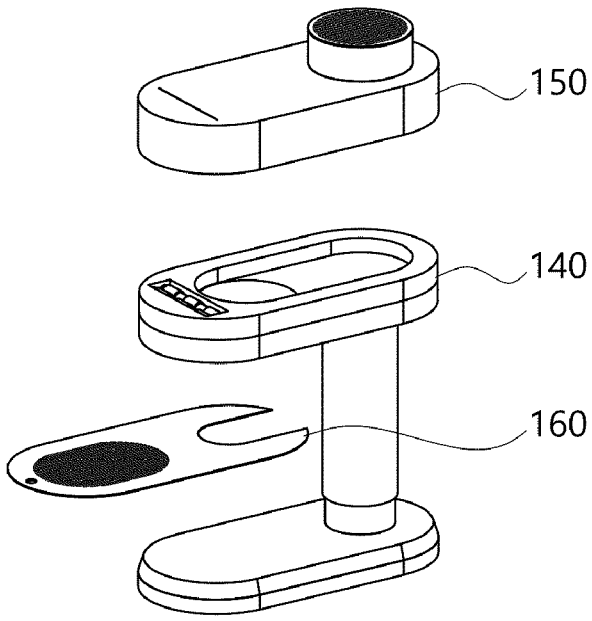


FIG. 28C

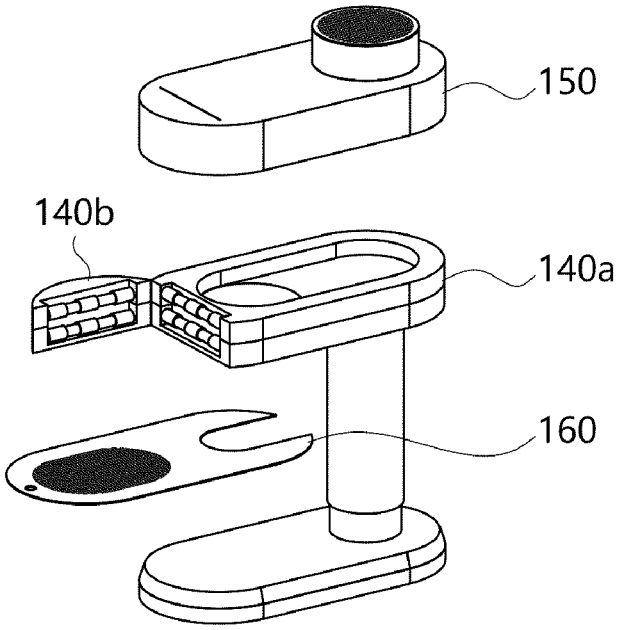


FIG. 28D

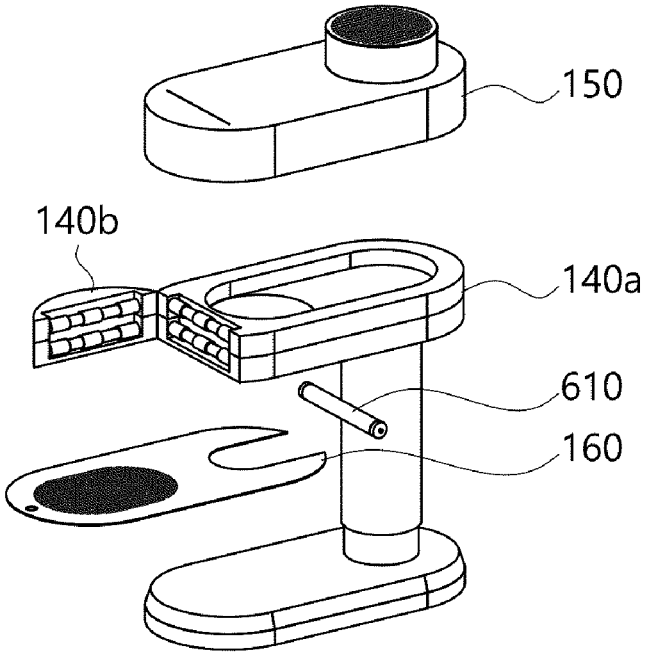


FIG. 29A

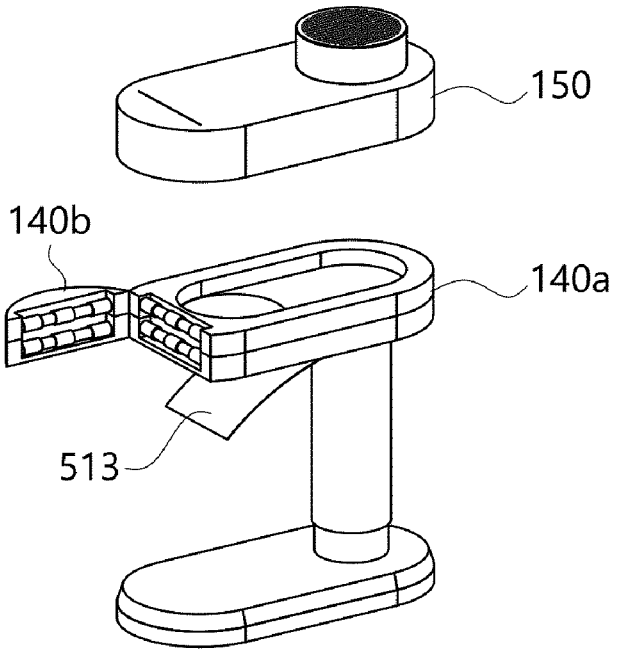


FIG. 29B

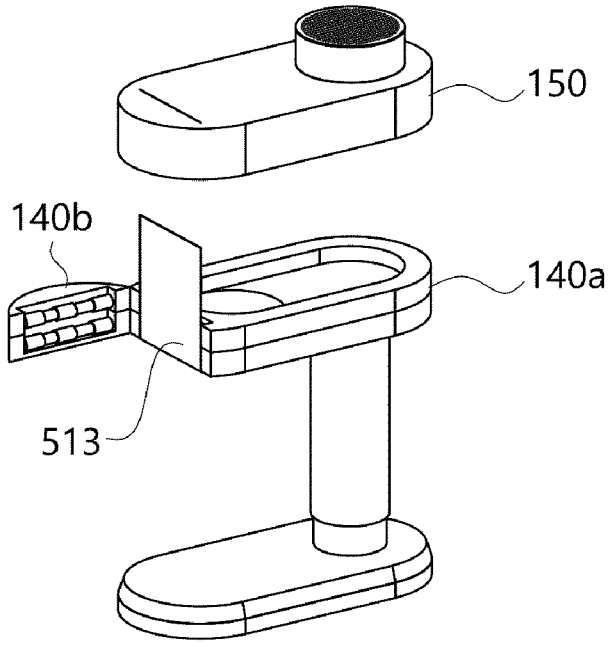
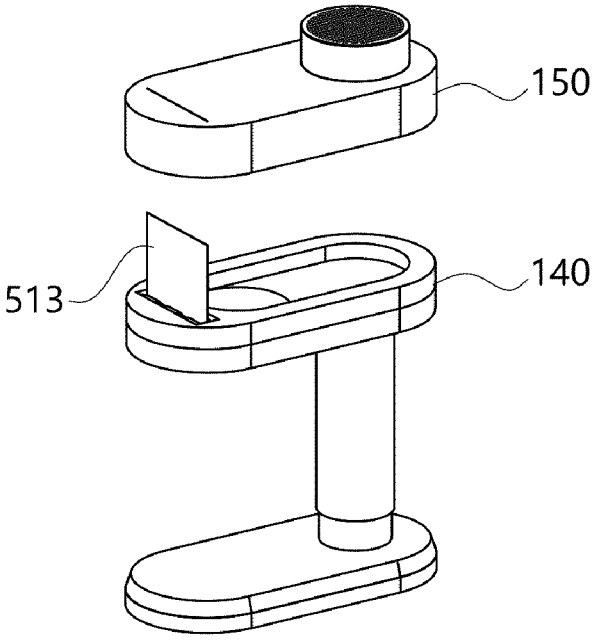


FIG. 29C



PORTABLE HOOD

CROSS-REFERENCE TO RELATED APPLICATION(S)

The present application claims priority to Korean Patent Application No. 10-2021-0054478, filed in Korea on Apr. 27, 2021, the entire contents of which is hereby incorporated by reference.

BACKGROUND

1. Field

A portable hood, and more particularly, a portable hood which is used while food is cooked is disclosed herein.

2. Background

Generally, a hood is installed above a heating appliance for cooking such as a gas stove or induction cooker, and draws, for example, odors, water vapor, oil vapor, or fine dust thereto (hereinafter, referred to as "oil vapor") which is generated during cooking of food or other items (hereinafter, collectively "food") by the heating appliance and discharges it to the outside. An installation position of the heating appliance, such as a gas stove or induction cooker, is fixed, so the installation position of the hood installed above the heating appliance is also generally fixed.

As described above, a fixed hood installed above the heating appliance is generally installed at a position somewhat higher than the heating appliance for a kitchen structure or convenience in cooking. Accordingly, a distance between an actual cooking location and a suction inlet of the fixed hood is far, so oil vapor generated during cooking may not all be removed through the hood. Accordingly, the oil vapor not removed by the hood may flow into a room and cause odor or cause stains on walls or furniture. In addition, the existing fixed hood may be used in a fixed heating appliance, such as a gas stove or induction cooker, but cannot be used when meat is grilled by a portable burner placed on a dining table or in a living room, or when cooking is performed outdoors as in camping.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments will be described in detail with reference to the following drawings in which like reference numerals refer to like elements, and wherein:

FIG. **1** is a perspective view of a portable hood according to an embodiment;

FIGS. **2**A, **2**B, and **2**C are views illustrating states of use of the portable hood according to an embodiment;

FIG. **3** is a cross-sectional view of a head, taken along line III-III of FIG. **1** according to an embodiment;

FIG. **4** is a partial exploded perspective view of the portable hood according to an embodiment;

FIG. **5** is a cross-sectional view of a flow path, taken along line V-V of FIG. **4** according to an embodiment;

FIG. **6** is a cross-sectional view illustrating a discharge outlet according to an embodiment;

FIG. **7** is a partial exploded perspective view illustrating a discharge outlet according to another embodiment;

FIGS. **8** and **9** are views illustrating a coupling relationship between a discharge fan and a fan motor according to an embodiment;

FIGS. **10**, **11**A, and **11**B are views illustrating a height adjustment structure of a column according to an embodiment;

FIGS. **12** and **13** are views of a rotation unit according to an embodiment;

FIGS. **14** to **16** are views illustrating the discharge fan and the fan motor integrated with each other according to an embodiment;

FIG. **17** is a perspective view illustrating an installed state of a weight plate of a portable hood according to another embodiment;

FIGS. **18**A and **18**B are views illustrating an installed state of a battery module of a portable hood according to still another embodiment;

FIG. **19** is a front view of a portable hood according to an embodiment;

FIG. **20** is a view illustrating a state of use of a portable hood according to still another embodiment;

FIGS. **21** to **27** are views illustrating a roll filter unit according to an embodiment; and

FIGS. **28**A, **28**B, **28**C, **28**D, **29**A, **29**B, and **29**C are views illustrating a process in which a filter roll is newly mounted in a portable hood according to an embodiment.

DETAILED DESCRIPTION

Advantages and features of embodiments and methods of achieving them will become apparent with reference to the embodiments described below in conjunction with the accompanying drawings. However, embodiments are not limited to the embodiments disclosed below, but may be implemented in various forms, and the embodiments are only provided so that the disclosure is complete, and to fully inform those skilled in the art to which the embodiments pertain, and the embodiments are defined only by the scope of the claims. The same reference numerals refer to the same elements throughout the specification.

As illustrated in FIG. **1**, a portable hood **10** according to an embodiment may include a head unit or head **100**, a base unit or base **200**, a columnar unit or column **300**, and a fan unit or fan **410** and **420** (see FIG. **3**).

The base **200** according to an embodiment may sit on a foundation. In this embodiment, it is exemplified that a shape of a flat surface of the base **200** has a shape of an oblong racetrack; however, embodiments are not limited thereto.

The head **100** may allow air to be introduced thereto and then may discharge the introduced air to the outside. The column **300** may connect the head **100** with the base **200** such that the head **100** is spaced apart upward from the base **200**. In this embodiment, the column **300** is coupled to the head **100** horizontally biased.

The fan **410** and **420** may be installed inside of the head **100** and may be located biased to a horizontal side of the head **100** corresponding to the column **300**. Accordingly, although the column **300** is coupled to the head **100** such that the column **300** is biased horizontally relative to the head **100**, a center of weight of the portable hood **10** may be formed at a side of the column **300**. Accordingly, the portable hood **10** according to this embodiment may maintain a stable standing state due to the center of weight of the portable hood **1** being at the side of the column **300**, so tipping over of the portable hood **10** may be prevented.

The fan **410** and **420** according to this embodiment will be described hereinafter.

The head **100** may include a suction inlet **110** and a discharge outlet **120**. Air may be introduced into the suction

inlet **110** according into this embodiment. Further, the air introduced into the suction inlet **110** may be discharged through the discharge outlet **120** to the outside.

In this embodiment, as illustrated in FIG. **1**, the suction inlet **110** and the discharge outlet **120** may be formed eccentrically to each other in a horizontal direction relative to a vertical direction. That is, air may be introduced at a side in the horizontal direction relative to the head **100** and may be discharged through the discharge outlet **120** biased from the suction inlet **110** in the horizontal direction. In this embodiment, the discharge outlet **120** is located biased in a direction toward the column **300** relative to the suction inlet **110**.

With this configuration, bypassing of air occurring when the suction inlet **110** and the discharge outlet **120** are located on a same axis in a vertical direction, that is, a flow of air in a direction toward the discharge outlet **120** along an outside boundary of the head **100** due to failure of the introduction of some of the air to the suction inlet **110** due to the flow of air discharged through the discharge outlet **120** or cooking heat may be prevented, so that efficiency of drawing air may be improved.

In this embodiment, for example, the head **100** may have the oblong racetrack shape corresponding to a shape of the base **200**, and the suction inlet **110** may be formed at a first side of the head **100** in a horizontal direction, and the discharge outlet **120** may be formed at a second side thereof. Further, the column **300** may be eccentrically coupled to the head **100** such that the column **300** is located at a side of the discharge outlet **120**. In addition, the column **300** may be rotatably coupled to the base **200** such that the suction inlet **110** is rotatable side to side in the horizontal direction. With this configuration, the head **100** may rotate relative to the column **300**, which functions as a shaft of the head **100**, the column **300** being coupled to a side of the discharge outlet **120**, and the suction inlet **110** eccentric from the discharge outlet **120** in the horizontal direction may rotate horizontally, so that a position of the suction inlet **110** may be adjusted.

FIGS. **2**A, **2**B, and **2**C are views illustrating states of use of the portable hood according to an embodiment. The states of use of the portable hood illustrated in FIGS. **2**A, **2**B, and **2**C illustrates use of the portable hood in a kitchen in a general household in which a fixed hood **50** is fixed just as an induction cooker is fixed.

Referring to FIGS. **2**A, **2**B, and **2**C, when the portable hood **10** according to an embodiment is not used, as illustrated in FIG. **2**A, the head **100** may be rotated such that the head **100** and the base **200** face each other so as to minimize space occupied by the base **200** and the head **100**. In addition, as illustrated in FIGS. **2**B and **2**C, in a state in which the portable hood **10** according to an embodiment is seated at a left (first) or right (second) side of a heating appliance **30** according to a position of a burner being used among burners of the heating appliance **30**, such as an induction cooker, the head **100** may be adjusted to be rotated in a lateral (left or right) direction such that the suction inlet **110** of the head **100** is located above a cooking utensil **31**, such as a pot.

Accordingly, the suction inlet **110** may be adjusted to be located adjacent to an upper portion of the cooking utensil **31** according to a cooking environment, such as the position of the burner being used, and thus, oil vapor may be introduced into the suction inlet **110** at the position adjacent to the upper portion of the cooking utensil **31**, so that efficiency of drawing oil vapor may be effectively increased.

FIG. **3** is a cross-sectional view of a head according to an embodiment. The cross-sectional view illustrated in FIG. **3** illustrates a section in an eccentric direction of a suction inlet and a discharge outlet.

The suction inlet **110** according to this embodiment may be open downward and may introduce air thereinto from a position located under the suction inlet **110**. Further, the discharge outlet **120** may be open upward and may discharge air introduced through the suction inlet **110** in an upward direction.

With this configuration, as illustrated in FIGS. **2**A, **2**B, and **2**C, in a state in which the suction inlet **110** is located adjacent to the upper portion of the cooking utensil **31**, the suction inlet **110** may introduce oil vapor thereinto from a lower side of the suction inlet **110** so as to improve efficiency of drawing air. Further, the introduced the oil vapor may be discharged in the upward direction through the discharge outlet **120** located at a position eccentric from the suction inlet **110** in the horizontal direction, and as described above, the bypassing of air caused by air discharged through the discharge outlet **120** or cooking heat of the cooking utensil **31** may be prevented.

In addition, the discharge outlet **120** may be configured to discharge oil vapor upward. Accordingly, as illustrated in FIGS. **2**A, **2**B, and **2**C, the oil vapor may be discharged in a direction toward the fixed hood **50**, whereby the portable hood **10** may effectively remove oil vapor generated during cooking in cooperation with the fixed hood **50**.

The suction inlet **110** and the discharge outlet **120** may be formed in the head **100** such that the suction inlet **110** and the discharge outlet **120** are eccentrical so as not to overlap vertically. Accordingly, the flow of air introduced into the suction inlet **110** and the flow of air discharged from the discharge outlet **120** may not affect each other, so that efficiency of drawing and discharging air may be improved.

As illustrated in FIG. **3**, the fan **410** and **420** of the portable hood **10** according to this embodiment may include a discharge fan **410**.

The discharge fan **410** according to this embodiment may be installed in the discharge outlet **120**. Further, the discharge fan **410** may generate a drawing force such that air is introduced through the suction inlet **110** and discharged to the discharge outlet **120**.

The discharge fan **410** may be installed at the discharge outlet **120**, whereby the center of weight of the portable hood **10** may be formed at the side of the column **300** at which the discharge outlet **120** is formed. Accordingly, as illustrated in FIGS. **2**A, **2**B, and **2**C, even if the suction inlet **110** of the head **100** rotates in the horizontal direction, the center of weight of the portable hood **10** may be located at the side of the column **300**, so that even when the head **100** rotates horizontally, the portable hood **10** according to an embodiment may be prevented from tipping over.

In addition, the fan **410** and **420** according to an embodiment of the present disclosure may further include a fan motor **420**. In this embodiment of the present disclosure, the fan motor **420** may be installed under the discharge fan **410** and may rotate the discharge fan **410**.

That is, the discharge fan **410** and the fan motor **420** may be installed in the head **100** such that the discharge fan **410** and the fan motor **420** are located at the side of the column **300**, for example, at the upper side of the column **300** as illustrated in FIG. **3**, so as described above, the center of an entire weight of the portable hood **10** may be formed at the column **300**, whereby tipping over of the portable hood **10** may be prevented.

In this embodiment, the fan motor **420**, the discharge fan **410**, and the column **300** may be installed such that central axes of the fan motor **420**, the discharge fan **410**, and the column **300** correspond to each other. Further, as illustrated in FIG. **3**, the discharge fan **410** and a rotational shaft of the fan motor **420** are configured to extend in the vertical direction. Furthermore, the discharge fan **410** and the fan motor **420** may be installed in the head **100** such that the rotational shaft is located inside of the column **300**. Accordingly, the center of weight of the portable hood **10** may be formed to be adjacent to the column **300**.

FIG. **4** is a partial exploded perspective view of the portable hood according to an embodiment. FIG. **4** illustrates a disassembled state of a portion of the head **100** of the portable hood **10**. Referring to FIG. **4**, the head **100** according to this embodiment may include a head main body **130** and a flow path **170**.

The suction inlet **110** and the discharge outlet **120** described above may be formed at the head main body **130** such that the suction inlet **110** and the discharge outlet **120** are eccentric in the horizontal direction. The flow path **170** according to this embodiment may be provided in the head main body **130** and may be a flow path through which air introduced through the suction inlet **110** flows to the discharge outlet **120**.

FIG. **5** is a cross-sectional view of a flow path, taken along line V-V of FIG. **4** according to an embodiment. Referring to FIG. **5**, for an example, flow path **170** according to an embodiment may include an inlet **171**, an outlet **172**, and an inner flow path **173**.

The inlet **171** may be formed by being open downward toward the suction inlet **110** of the head main body **130**. Further, the outlet **172** may be formed by being open upward toward the discharge outlet **120** of the head main body **130**. Furthermore, the inner flow path **173** may provide communication between the inlet **171** and the outlet **172** in the horizontal direction.

In this embodiment, as illustrated in FIGS. **4** and **5**, the flow path **170** is a container-shaped member having the inlet **171**, the outlet **172**, and the inner flow path **173** and may be installed inside of the head main body **130**. A flow space **141** in which the flow path **170** sits may be formed in the head main body **130**, as illustrated in FIG. **4**.

In the embodiment illustrated in FIGS. **4** and **5**, the flow path **170** is provided as a separate member and is installed in the flow space **141** inside of the head main body **130**; however, the head main body **130** may include the inlet **171**, the outlet **172**, and the flow path **170** having the inner flow path **173** formed inside of the head main body **130** through processing of an inside of the head main body **130**.

As illustrated in FIG. **5**, at an inner wall surface of the inner flow path **173**, an edge portion or edge **174** in which a flow direction of air is changed may be configured to have a round shape, so as to minimize flow loss of air generated when the air flowing through the flow path **170** collides with the wall surface.

A cross-sectional area of the discharge outlet **120** may be wider than a cross-sectional area of the flow path **170**, in particular, a cross-sectional area of the inner flow path **173**. In general, flow loss may be caused by expansion or contraction of a flow path. When a flow path expands or contracts, flow loss may be minimized in a case in which the cross-sectional area of the discharge outlet **120** is wider than the cross-sectional area of the flow path **170**.

In this embodiment, the discharge fan **410** and the fan motor **420** may be installed in the head main body **130** such that the discharge fan **410** and the fan motor **420** are located at an upper side and a lower side, respectively, of the outlet **172** of the flow path **170**. More specifically, as illustrated in FIG. **3**, the discharge fan **410** may be installed in the head main body **130** such that the discharge fan **410** is located at the upper side of the outlet **172** of the flow path **170**. Further, the fan motor **420** may be installed in the head main body **130** such that the fan motor **420** is located at the lower side of the outlet **172** of the flow path **170**.

With this configuration, in a process in which oil vapor introduced through the suction inlet **110** is discharged to the discharge outlet **120** through the flow path **170**, the oil vapor may be discharged to the outside without passing through the fan motor **420** installed under the flow path **170**, so that contamination of the fan motor **420** by the oil vapor may be prevented. Accordingly, in a process of disassembling the portable hood **10** to wash the portable hood **10** it is not necessary to disassemble the fan motor **420**, so that the process of the dissembling and washing of the portable hood may be simplified.

As illustrated in FIG. **4**, the head main body **130** according to an embodiment may include a casing main body **140**, an upper casing **150**, and a lower casing **160**. In the casing main body **140** according to an embodiment, the inlet **171** may be formed at the suction inlet **110**. Further, as described above, the separate flow path **170** may be installed in the casing main body **140**. As illustrated in FIG. **3**, the flow space **141** in which the flow path **170** sits may be formed in the casing main body **140**.

The discharge outlet **120** may be formed at the upper casing **150**. In this embodiment, the flow space **141** formed in the casing main body **140** may have a shape open upward, and the upper casing **150** may be coupled to the casing main body **140** from an upper side of the casing main body **140** to shield the flow space **141**. Accordingly, after removing the upper casing **150** from the casing main body **140**, a user may remove the flow path **170** sitting in the flow space **141**, so that washing of the flow path **170** may be performed.

The upper casing **150** may be coupled to the casing main body **140** such that the upper casing **150** covers a side surface of the casing main body **140**. That is, the upper casing **150** may form a side outer surface of the head main body **130**.

The lower casing **160** according to this embodiment may be coupled to the casing main body **140** from a lower side of the casing main body **140**. The lower casing **160** according to an embodiment may have a plate shape.

A through hole (not shown) may be formed vertically through the lower casing **160** such that the through hole is located at a position corresponding to the suction inlet **110**. Further, a pre-filter **514** may be installed in the through hole formed in the lower casing **160**. The pre-filter **514** may filter dust or foreign matter having a relatively large size, for example, introduced into the suction inlet **110**.

As illustrated in FIGS. **3** and **4**, the discharge outlet **120** according to an embodiment may further include a fan housing **121**. The fan housing **121** according to an embodiment may protrude upward from an upper flat surface of the head main body **130**. The upper casing **150** may constitute the upper flat surface of the head main body **130**, and the fan housing **121** may be formed by protruding upward from an upper flat surface of the upper casing **150**.

In this embodiment, the fan housing **121** may have a cylindrical shape open in the vertical direction, and the discharge fan **410** may be received in the fan housing **121**. More specifically, in a state in which the fan housing **121** is configured to protrude upward from the upper casing **150** of the head main body **130**, the fan housing **121** may be

configured to receive the discharge fan **410** therein, whereby as illustrated in FIG. **3**, even if the discharge fan **410** and the fan motor **420** are arranged vertically in the head main body **130**, an entire thickness of the head main body **130** may be slimmed.

A discharge grill **122** may be removably coupled to an upper opening of the fan housing **121** according to an embodiment and may cover the upper opening of the fan housing **121**. Accordingly, the discharge grill **122** may prevent accidents which may occur during rotation of the discharge fan **410** and enable oil vapor to be discharged to the upper side of the discharge fan **410**.

In this embodiment, the discharge fan **410** may be detachably coupled to the fan housing **121** by magnetic force. Referring to FIG. **6**, at least one first magnetic member or magnet M**1** may be installed at an edge of the discharge grill **122**, and a second magnetic member or magnet M**2** corresponding to the first magnetic member M**1** may be installed at an upper edge of the fan housing **121**, whereby the discharge grill **122** may be removably coupled to the upper portion of the fan housing **121**. Both the first magnetic member M**1** and the second magnetic member M**2** may have a magnetic force, or only one magnetic member may have a magnetic force.

As another example, the discharge grill **122** may be coupled to the fan housing **121** in a forcible fitting manner, or the discharge grill **122** may be hooked to the fan housing **121** by rotating the discharge grill **122**. Accordingly, the discharge grill **122** may be detachably coupled to the fan housing **121** in various manners.

In the embodiment illustrated in FIG. **4**, the fan housing **121** is integrated with the upper casing **150** of the head main body **130**, so that the fan housing **121** is configured such that the fan housing **121** cannot be removed from the upper casing **150** of the head main body **130**. As another example, as illustrated in FIG. **7**, the fan housing **121** may be detachably coupled to the upper casing **150** of the head main body **130**.

FIGS. **8** and **9** are views illustrating a coupling relationship between a discharge fan and a fan motor according to an embodiment. Referring to FIGS. **3**, **8**, and **9**, fan motor **420** according to an embodiment may include a fan shaft **421**. The fan shaft **421** may extend from the fan motor **420** toward the discharge fan **410** and may transmit a rotational force of the fan motor **420** to the discharge fan **410**. As illustrated in FIG. **8**, threads **423** may be formed at an outer circumferential surface of an end portion or end of the fan shaft **421** of the discharge fan **410**.

The discharge fan **410** according to this embodiment may include a shaft through hole **411** (see FIG. **6**) formed vertically therethrough. When connecting the discharge fan **410** with the fan motor **420**, the end portion of the fan shaft **421** may pass through the shaft through hole **411** such that the discharge fan **410** and the fan shaft **421** are coupled to each other. In this case, the end portion of the fan shaft **421**, that is, the end portion on which the threads **423** are formed may be exposed to the upper side of the discharge fan **410**.

The discharge fan **410** according to this embodiment may further include a fan nut **412**. The fan nut **412** may be engaged with the threads **423** formed at the end portion of the fan shaft **421** passing through the shaft through hole **411** such that the discharge fan **410** is held to the fan shaft **421**. According to this configuration, after the discharge grill **122** is removed from the fan housing **121**, the fan nut **412** may be unscrewed from the fan shaft **421**, so that the discharge fan **410** may be removed from the fan shaft **421**.

A fan holding portion or holder **413** may be formed at a lower portion of the discharge fan **410**. Further, the fan shaft **421** may further include a shaft holding portion or holder **422** held in the fan holding portion **413**.

The shaft holding portion **422** according to an embodiment may protrude radially outward from an outer surface of the fan shaft **421** and may be held in the fan holding portion **413** when the fan shaft **421** passes through the shaft through hole **411**. As illustrated in FIGS. **8** and **9**, the shaft holding portion **422** may be provided in the shape of a bar that protrudes radially outward from the fan shaft **421**, and the fan holding portion **413** may have a slot formed therein such that the bar-shaped shaft holding portion **422** may be inserted into the slot. Accordingly, when the fan shaft **421** is rotated by rotation of the fan motor **420**, the shaft holding portion **422** held in the fan holding portion **413** may rotate the discharge fan **410**.

The column **300** according to an embodiment may be provided such that a distance between the head **100** and the base **200**, that is, a height of the head **100** is adjustable. FIGS. **10**, **11**A, and **11**B are views illustrating a height adjustment structure of column **300** according to an embodiment.

Referring to FIGS. **10**, **11**A, and **11**B, the column **300** according to an embodiment may include a first column **310**, a second column **320**, and a height adjustment unit **330**. The first column **310** may be coupled to the head **100** at a first side thereof. The first column **310** is illustrated as having a cylindrical shape; however, embodiments are not limited thereto and the first column may be provided, for example, in the shape of a polygonal pillar, such as a container having a square cross section.

The second column **320** may be coupled to the base **200** at a first side thereof. The shape of the second column **320** may correspond to the shape of the first column **310**, and thus, may have a cylindrical shape. Alternatively, the second column **320** may have a shape different from the cylindrical shape corresponding to the first column **310**.

A second side of the second column **320**, that is, an upper area of the second column **320** may be inserted through a lower portion of the first column **310**, which is a second side of the first column **310**. Accordingly, a height of the head **100** may be adjusted according to a height of the second column **320** inserted into the lower portion of the first column **310**. The height adjustment unit **330** according to an embodiment may vertically move the first column **310** relative to the second column **320** such that the height of the head **100** is adjustable.

In this embodiment, as illustrated in FIGS. **10**, **11**A, and **11**B, the height adjustment unit **330** may include a rack member or rack **331**, a pinion member or pinion **332**, and a damper **333**. The rack **331** according to an embodiment may be installed at a first side of one of the first column **310** or the second column **320**. In this embodiment, as illustrated in FIGS. **11**A and **11**B, the rack **331** is installed in the first column **310**.

The rack member **331** may extend along the vertical direction of a first guide member or guide **311** coupled to an inner surface of the first column **310**. The pinion **332** according to an embodiment may rotate in engagement with the rack **331**. The pinion **332** may be coupled to the second column **320** (or the first column **310**, the same hereinafter) through the damper **333**, so that the pinion **332** may vertically move together with the second column **320**.

The damper **333** according to an embodiment may be installed at a second side of one of the first column **310** and the second column **320**. That is, in a case in which the rack

331 is installed at the first column 310, the damper 333 may be installed at the second column 320, and in a case in which the rack 331 is installed at the second column 320, the damper 333 may be installed at the first column 310. In this embodiment, the damper 333 is installed at the second column 320. Further, in this embodiment, the damper 333 may be installed at a second guide member or guide 321 coupled to an inner surface of the second column 320.

The damper 333 may be connected to a rotational shaft of the pinion 332 and may vertically move the first column 310 when the pinion 332 rotates in engagement with the rack 331. In this case, the damper 333 provides a load to the first column 310 such that a vertical position of the first column 310 is maintained, so that a height of the head 100 may be adjusted to a predetermined height.

Accordingly, when adjusting the height of the head 100, a user may vertically move the head 100. The head 100 may vertically move while the rack 331 operates in engagement with the pinion 332. Further, when a user stops the vertical movement of the head 100 at a desired height, the vertical movement of the head 100 may stop at the desired height according to the load of the damper 333, so that the height of the head 100 may be adjusted to the desired height.

In this embodiment, as illustrated in FIGS. 11A and 11B, a guide groove 312 may be formed at the first guide 311 along a vertical direction thereof. Further, a guide rib (not shown) may be formed at the second guide 321 such that the vertical movement of the head 100 is guided with the guide rib inserted into the guide groove 312. Accordingly, vertical relative movement of the first guide 311 to the second guide 321 may be stable, so that the vertical movement of the first column 310 may be stably performed.

As described above, in the portable hood 10 according to an embodiment, the head 100 rotates horizontally relative to the column 300. The portable hood 10 according to an embodiment may further include a rotation unit 700 that couples the column 300 and the base 200 to each other such that the column 300 rotates relative to the base 200.

FIGS. 12 and 13 are views of a rotation unit according to an embodiment. Referring to FIGS. 12 and 13, rotation unit 700 according to an embodiment may include a first rotating member 710 and a second rotating member 720.

The first rotating member 710 may be installed at a lower portion of the column 300. In this embodiment, the column 300 includes the first column 310 and the second column 320, and the first rotating member 710 is installed at a lower portion of the second column 320.

The second rotating member 720 may be installed at the base 200. The second rotating member 720 may support the first rotating member 710 such that the first rotating member 710 is rotatable to rotate the column 300.

In this embodiment, the first rotating member 710 has a shape of a circular plate. Further, the second rotating member 720 may have a shape of a circular ring to support the first rotating member 710 such that the second rotating member 720 is rotatable along an inner circumference of the first rotating member 710. Accordingly, the first rotating member 710 may stably rotate in the second rotating member 720 having the shape of a circular ring.

A holding protrusion 711 may be formed on an outer circumference of the first rotating member 710 protruding outward in a radial direction therefrom. Further, a plurality of holding recesses 721 may be formed at predetermined angle intervals at an inner circumference of the second rotating member 720. When the first rotating member 710 rotates, the holding protrusion 711 may be inserted and held in the holding recess 721 formed at a predetermined angle, and a user may recognize a predetermined angular rotation and the holding of the holding protrusion 711 may be maintained at the associated angle in a state in which an external force is not applied.

For example, three holding recesses 721 may be formed at 90° intervals. The three holding recesses 721 may be formed at positions at which the base 200 and the head 100 are located side by side in a vertical direction, as illustrated in FIG. 2A, and at positions of the head 100 rotating 90° to the left and to the right relative to the base 200, as illustrated in FIGS. 2B and 2C. Accordingly, the holding recess 721 may be formed at an angle with a relatively high frequency of use among rotational angles of the head 100 such that user convenience of the portable hood 10 is increased.

The rotation unit 700 according to an embodiment may further include a rotation control portion 730. For example, the rotation control portion 730 may control rotation of the first rotating member 710 such that the head 100 rotates only to a preset or predetermined angle from a position parallel to the base 200. For example, in this embodiment, as illustrated in FIGS. 2A, 2B, and 2C, the rotation control portion 730 may control the rotation of the first rotating member 710 such that the first rotating member 710 may rotate by 90° to each side, a maximum of 180°.

In this embodiment, the rotation control portion 730 may include a control member 731 coupled to the first rotating member 710, and a control groove 732 formed at the base 200. The control groove 732 may be formed at a flat surface of the base 200 such that the control groove 732 has a semicircular shape of 180°. A control protrusion 731*a* formed at the control member 731 may be held in the control groove 732 such that the control member 731 rotates only within the range of 180° while the control member 731 rotates with the control protrusion 731*a* inserted in the control groove 732.

According to this configuration, the head 100 may be configured to rotate 90° to each side, that is, only within a range of 180°, whereby twisting of a cable connected from the base 200 to the head 100, for example, a power cable or signal cable for rotation and control of the fan motor 420 may be minimized.

In addition, as illustrated in FIGS. 2A, 2B, and 2C, the portable hood 10 according to an embodiment may be used at various angles within a 180° rotational range and may cover any position at which the portable hood 10 is required to be used.

In the embodiment described above, the discharge fan 410 and the fan motor 420 of the portable hood 10 according to an embodiment are described as arranged vertically at the upper side of the column 300.

As another example, the discharge fan 410 and the fan motor 420 according to an embodiment may be integrated with each other and may be installed at the upper side of the column 300. FIGS. 14 to 16 are views illustrating the a discharge fan and a fan motor integrated with each other according to an embodiment.

Referring to FIGS. 14 to 16, discharge fan 410*a* may be installed in the discharge outlet 120, for example, inside of fan housing 121*a*. Further, fan motor 420*a* may be installed in the discharge fan 410*a* and may rotate the discharge fan 410*a*.

In addition, the discharge outlet 120 according to an embodiment may further include shaft connection member or connector 123*a*. The shaft connection member 123*a* may connect the rotational shaft of the discharge fan 410*a* to discharge grill 122*a* such that the discharge fan 410*a* rotates inside of the fan housing 121*a*. Accordingly, when removing

the discharge grill **122***a* from the fan housing **121***a*, the discharge fan **410***a* and the fan motor **420** together may be removed from the fan housing **121***a* by the shaft connection member **123***a*.

According to this configuration, the discharge fan **410***a* and the fan motor **420** may be integrally received in the fan housing **121***a*, and as described above, a center of weight of the portable hood **10** according to an embodiment may be formed at the column **300**, so tipping over of the portable hood **10** may be prevented.

In order to connect a power cable to the fan motor **420** installed inside of the discharge fan **410***a*, the portable hood **10** according to an embodiment may further include a first connector **127***a* and a second connector **128***a*. The first connector **127***a* may be installed at the discharge grill **122***a* and may be electrically connected to the fan motor **420**. Further, the second connector **128***a* may be installed at the fan housing **121***a* such that the second connector **128***a* is located at a position corresponding to a position of the first connector **127***a*. When the discharge grill **122***a* is mounted to the fan housing **121***a*, the second connector **128***a* may be connected to the first connector **127***a* and may supply power to the fan motor **420**. The second connector **128***a* may be electrically connected to a printed circuit board installed at the base **200** through the column **300**, so that when the first connector **127***a* and the second connector **128***a* are connected to each other, power may be supplied to the fan motor **420**.

As illustrated in FIG. **16**, the discharge outlet **120** according to an embodiment may include a holding jaw **124***a*, a holding lever **125***a* and **125***b*, and an elastic member or spring **126***a*. The holding jaw **124***a* according to an embodiment may be installed at the discharge grill **122***a*. The holding jaw **124***a* may be inserted into the fan housing **121***a* when the discharge grill **122***a* is mounted to the fan housing **121***a*.

The holding lever **125***a* and **125***b* according to an embodiment may be installed at the fan housing **121***a* such that the holding lever **125***a* and **125***b* may be held in and released from the holding jaw **124***a*. Accordingly, in a state in which the holding lever **125***a* and **125***b* is held in the holding jaw **124***a*, the discharge grill **122***a* may be coupled to and held in the fan housing **121***a*, and when the holding lever **125***a* and **125***b* is released from the holding jaw **124***a*, the discharge grill **122***a* may be removed from the fan housing **121***a*.

The elastic member **126***a* according to an embodiment may elastically press the holding lever **125***a* and **125***b* in a direction in which the holding lever **125***a* and **125***b* is held in the holding jaw **124***a*. In this embodiment, the holding lever **125***a* and **125***b* may be located at an outer side of the fan housing **121***a* and may include a lever **125***a* which may be pulled by a user's hand and a holding portion **125***b* that extending to an inner side of the fan housing **121***a* from the lever **125***a* and held in and released from the holding jaw **124***a*. Further, the elastic member **126***a* may be provided as a tension spring and may pull the lever **125***a* in a direction in which the holding portion **125***b* is held in the holding jaw **124***a* such that the holding portion **125***b* is maintained to be held in the holding jaw **124***a*.

According to the above configuration, when a user pulls the lever **125***a*, an elastic force of the tension spring may be overcome, and the holding portion **125***b* may be removed from the holding jaw **124***a*, so that the discharge grill **122***a* may be removed from the fan housing **121***a*.

As illustrated in FIG. **17**, base **200** according to another embodiment may include a weight plate **220**. The weight plate **220** may be made of metal, for example, and may be provided in the base **200** such that the column **300** and the head **100** are prevented from tipping over.

As described above, the head **100** and the base **200** according to an embodiment may be coupled eccentrically to the column **300** in horizontal directions, and the head **100** may be horizontally rotatable. The weight plate **220** made of relatively heavy metal may be provided in the base **200**, and thus, a center of weight of the portable hood **10** may be located at a lower side of the portable hood **10**, so that the portable hood **10** according to this embodiment may be prevented from tipping over.

The portable hood **10** according to an embodiment may further include a battery module **800**. The portable hood **10** may be provided with a power cable (not shown) to receive power and may have the battery module **800** installed therein to increase portability such that the battery module **800** supplies power required for operating the fan motor **420**.

In still another embodiment, as illustrated in FIGS. **18**A and **18**B, the battery module **800** may be provided inside of the column **300**. Accordingly, important components may be arranged in the column **300**, and the center of weight of the portable hood **10** may be formed at the column **300**, so that tipping over of the portable hood **10** may be prevented.

The battery module **800** may be arranged at a lower portion inside of the column **300**. When the height adjustment unit **330** described above is installed in the column **300**, as illustrated in FIG. **18**B, the height adjustment unit **330** may be located at the upper side of the column **300**, and the battery module **800** may be located at the lower portion of the column **300**. Accordingly, height adjustment of the column **300** may be performed, and due to inclusion of the battery module **800** inside of the column, the portable hood **10** according to an embodiment may be more effectively prevented from tipping over.

In addition, in a case in which the battery module **800** includes a plurality of battery modules, as illustrated in FIG. **18**A, the plurality of battery modules **800** may be horizontally arranged in parallel to each other in the column **300**. Accordingly, the portable hood **10** may maintain a more stable standing state, so that the portable hood **10** may be prevented from tipping over.

Further, in the portable hood **10** according to an embodiment, as illustrated in FIG. **19**, a width w**1** of the base unit **200** in a direction perpendicular to a direction toward the suction inlet **110** from the discharge outlet **120** eccentric from each other may be equal to or wider than a width w**2** of the head **100**. That is, in a short length direction of a horizontal cross-section of each of the base **200** and the head **100**, the width w**1** of the base **200** may be equal to or wider than the width w**2** of the head **100**. Accordingly, a more stable standing of the portable hood **10** may be ensured, so that the portable hood **10** may be effectively prevented from tipping over.

In the above-described embodiments, the head **100** according to an embodiment may be configured to rotate in a horizontal direction and may be configured to be adjustable in height. For another example, as illustrated in FIG. **20**, head **100** according to still another embodiment may be coupled to the column **300** such that the head **100** may be adjusted by an angle in a vertical direction. Accordingly, the head **100** may perform adjustment of an air-introduction angle in addition to height adjustment and may effectively respond even to a cooking utensil located at a height beyond a range of the height adjustment of the head **100**.

The portable hood **10** according to an embodiment may further include a filter unit **500** as illustrated in FIG. **3**. The

filter unit **500** according to an embodiment may be installed in the suction inlet **110**. In this embodiment, the filter unit **500** may include at least one purification filter **512**, **513**, or **514** that purifies air introduced into the suction inlet **110**. For example, the purification filter **512**, **513**, **514** may include at least one of a deodorization filter **512** or an oil mist filter **513**. In this embodiment, the deodorization filter **512** and the oil mist filter **513** are installed in the suction inlet **110**. As described above, pre-filter **514** installed in the through hole of the lower casing **160** may be included as a component of the purification filter **512**, **513**, or **514**.

In this embodiment, as the oil mist filter **513**, a fiber filter, such as a non-woven fabric, may be applied. Further, an aluminum mesh filter may be used as pre-filter **514**, and a filter made of corrugated activated carbon may be used as deodorization filter **512**. The example of each of the deodorization filter **512**, the oil mist filter **513**, and the pre-filter **514** described above is used in this embodiment; however, embodiments are not limited thereto, and filters made of other materials may be utilized.

In this embodiment, as illustrated in FIG. **4**, after the upper casing **150** is removed from the casing main body **140**, the deodorization filter **512** may be inserted from the upper side of the suction inlet **110** of the casing main body **140** and may be installed in the suction inlet **110**. Accordingly, after the upper casing **150** is removed from the casing main body **140**, replacement of the deodorization filter **512** may be performed.

The oil mist filter **513** according to an embodiment may be a roll filter. The portable hood **10** according to an embodiment may include roll filter unit **610** such that the oil mist filter **513** may be discharged past or through the suction inlet **110** to the outside of the head **100**.

FIGS. **21** to **27** are views illustrating a roll filter unit according to an embodiment. Referring to FIGS. **21** to **27**, roll filter unit **600** according to an embodiment may include a filter roll **610** and filter transportation unit **620**.

The oil mist filter **513** may be wound on the filter roll **610**. The filter roll **610** may be rotatably installed at the head **100** with the oil mist filter **513** wound on the filter roll **610**. In this embodiment, as illustrated in FIG. **21**, the filter roll **610** is removably installed at or in roll mounting portion **142** formed at a lower portion of the casing main body **140** of the head main body **130**.

The roll mounting portion **142** according to this embodiment may include a roll receiving portion **142***a* and a shaft coupling portion **142***b*. The roll receiving portion **142***a* may be open downward at a lower surface of the casing main body **140** such that the filter roll **610** may be inserted into the roll receiving portion **142***a* from a lower side of the casing main body **140**. Further, the shaft coupling portion **142***b* may be formed at each of opposite inner wall surfaces of the roll receiving portion **142***a*, so roll coupling kit **612** described hereinafter of the filter roll **610** may be coupled to the shaft coupling portion **142***b*.

As illustrated in FIGS. **22**, **23**A, and **23**B, the filter roll **610** according to this embodiment may include a filter drum **611** and a pair of roll coupling kits **612**. The filter drum **611** may have a cylindrical shape, and the oil mist filter **513** may be wound on the filter drum **611** along an outer circumferential surface thereof.

The pair of roll coupling kits **612** may be installed at opposite sides of the filter drum **611**, respectively. The pair of roll coupling kits **612** may support the filter drum **611** such that the filter drum **611** is rotatable, and when the filter roll **610** is installed in the roll mounting portion **142**, the filter roll **610** may be removably coupled to each of the shaft coupling portions **142***b*.

In this embodiment, as illustrated in FIGS. **23**A and **23**B, roll coupling kit **612** may include a kit body **613**, a first shaft protrusion **614**, and a second shaft protrusion **615**. The first shaft protrusion **614** may be rotatably coupled to a side surface of the filter drum **611** by protruding from a first side surface of the kit body **613**. A protrusion insertion hole **611***a* may be formed in the side surface of the filter drum **611** such that the first shaft protrusion **614** may be rotatably inserted into the protrusion insertion hole **611***a*.

The second shaft protrusion **615** may be inserted into the shaft coupling portion **142***b* of the roll mounting portion **142** by protruding from a second side surface of the kit body **613**. In this embodiment, when the second shaft protrusion **615** is coupled to the shaft coupling portion **142***b*, the second shaft protrusion **615** may be pressed in a direction of the second shaft protrusion **615** inserted into the shaft coupling portion **142***b*.

In this embodiment, as illustrated in FIGS. **23**A and **23**B, the kit body **613** according to an embodiment may include a first kit member **613***a*, a second kit member **613***b*, and a press member or spring **613***c*. The second shaft protrusion **615** may be provided at the first kit member **613***a* and may be coupled to the first kit member **613***a* such that the second shaft protrusion **615** moves in a direction of a rotational axis of the filter drum **611**. The first shaft protrusion **614** and the second shaft protrusion **615** may be integrated with flat surfaces of opposite sides of the second kit member **613***b*, respectively.

The press member **613***c* may be installed between the first kit member **613***a* and the second kit member **613***b*. Further, the press member **613***c* may press the second kit member **613***b* in a direction in which the second shaft protrusion **615** is inserted into the shaft coupling portion **142***b*. In this embodiment, the press member **613***c* may be provided as a compression spring.

With the above configuration, when installing the filter roll **610** in the roll mounting portion **142**, a user may insert the filter roll **610** into the roll receiving portion **142***a*. In this state, the user may push the second kit member **613***b* at a second side in a direction toward the first kit member **613***a* at the second side after inserting the second shaft protrusion **615** at a first side into the shaft coupling portion **142***b* at the first side such that the second shaft protrusion **615** at the second side is inserted into the shaft coupling portion **142***b* at the second side.

A coupling force of the second shaft protrusion **615** to the shaft coupling portion **142***b* and a coupling force of the first shaft protrusion **614** to the protrusion insertion hole **611***a* may be maintained constant by an elastic force of the press member **613***c*. Accordingly, when the filter transportation unit **620** moves the oil mist filter **513** wound on the filter roll **610**, the filter transportation unit **620** may hold the oil mist filter **513** with tension and may prevent the oil mist filter **513** from being easily unwound.

In this embodiment, a cut portion H may be formed by cutting a portion of an edge of the first kit member **613***a* directed toward the shaft coupling portion **142***b* and may provide a space into which a user may insert a finger to push the second kit member **613***b*.

As illustrated in FIG. **3**, the filter transportation unit **620** may be installed in the head **100** such that the filter transportation unit **620** is located at a side opposite to the filter roll **610** with the suction inlet **110** located between the filter transportation unit **620** and the filter roll **610**. In this embodi-

ment, the filter roll **610** may be installed inside of the casing main body **140** of the head main body **130**.

With the suction inlet **110** placed between the filter roll **610** and the filter transportation unit **620**, the filter roll **610** and the filter transportation unit **620** may be installed at opposite sides, respectively, in the eccentric direction of the suction inlet **110** and the discharge outlet **120**. In this case, with the suction inlet **110** located between the filter transportation unit **620** and the filter roll **610**, the filter roll **610** may be installed at a side of the discharge outlet **120** and at a side opposite to the filter transportation unit **620**.

The filter transportation unit **620** according to an embodiment may discharge the oil mist filter **513** extending past the suction inlet **110** from the filter roll **610** to the outside of the head **100**. For example, the filter transportation unit **620** may discharge the oil mist filter **513** to the upper side of the head **100**.

When described with reference to FIGS. **3**, **24**, and **25**, the filter transportation unit **620** according to an embodiment may include a first roller unit **630** and a second roller unit **640**. The first roller unit **630** and the second roller unit **640** may be installed in the casing main body **140** vertically spaced apart from each other and may discharge the oil mist filter **513** to the upper side of the head **100**.

For example, the first roller unit **630** and the second roller unit **640** according to an embodiment may include a first moving roller **631** and a second moving roller **632**, and a first moving roller **641** and a second moving roller **642**, respectively. The first moving rollers **631** and **641** and the second moving rollers **632** and **642** may rotate by facing each other in the horizontal direction with the oil mist filter **513** located therebetween, so that the oil mist filter **513** may be moved upward. In this embodiment, corrugation in the shape of gear teeth may be formed on an outer circumferential surface of each of the first moving roller **631** or **641** and the second moving roller **632** or **642** such that the oil mist filter **513** may be efficiently moved.

In this embodiment, for example, the filter transportation unit **620** may further include a cutting unit **650**. For example, the cutting unit **650** may be located between the first roller unit **630** and the second roller unit **640** and may cut the purification filter **511**, **512**, **513**, or **514** in a transverse direction.

Accordingly, when the filter transportation unit **620** moves the oil mist filter **513** after the portable hood **10** according to an embodiment is used for a predetermined period of time, a new area of the oil mist filter **513** wound on the filter roll **610** may be moved to the suction inlet **110**, and an area of the oil mist filter **513** used earlier may be moved outside of the head **100** along the filter transportation unit **620**.

In this case, when the cutting unit **650** transversely cuts the oil mist filter **513** at a position located between the first roller unit **630** and the second roller unit **640**, a user may pull a portion of the oil mist filter **513** exposed to the upper side of the head **100** and may remove the exposed portion. Next, when the filter transportation unit **620** moves the oil mist filter **513** again, an end of the oil mist filter **513** may be exposed to the upper side of the head **100**, as illustrated in FIG. **1**. As illustrated in FIG. **1**, maintaining the exposure of the end of the oil mist filter **513** to the upper side of the head **100** when using the oil mist filter **513** is provided as an example, and the oil mist filter **513** may be controlled to expose an end thereof to the upper side of the head **100** only when cutting the end of the oil mist filter **513**.

FIG. **25** is a view illustrating cutting unit according to an embodiment. Cutting unit **650** may include a cutter **651** that cuts the oil mist filter **513**. Further, the cutting unit **650** may include a cutter moving unit or mover **652** configured to transversely reciprocate the cutter **651** such that the oil mist filter **513** is transversely cut.

For example, the cutter moving unit **652** may include a belt **653** and a pair of pulleys **654**. In a state in which the cutter **651** is installed at the belt **653**, when one of the pair of pulleys **654** performs forward and reverse rotations, the cutter **651** installed at the belt **653** may transversely cut the oil mist filter **513** while reciprocating along the belt **653**.

As illustrated in FIG. **3**, the filter roll **610** according to an embodiment may be installed in the roll mounting portion **142** such that the oil mist filter **513** wound on the filter roll **610** is unwound at the lower portion of the head main body **130** in a direction covering the lower portion of the head main body **130** and extends toward the lower portion of the suction inlet **110**. Further, the oil mist filter **513** moving past the suction inlet **110** may bend upward and may be moved to the upper side of the head **100** by the filter transportation unit **620**. With this configuration, the oil mist filter **513** unwound from the filter roll **610** may be moved by being bent only in one direction, so that efficient movement of the oil mist filter **513** by the filter transportation unit **620** may be performed.

In addition, the upper casing **150** according to an embodiment may include a filter discharge hole **151** formed vertically therethrough. Accordingly, the end of the oil mist filter **513** moved by the filter transportation unit **620** may be moved to the upper side of the head **100** through the filter discharge hole **151** formed in the upper casing **150** and may be discharged to the outside of the head **100**.

As illustrated in FIG. **26**, the filter discharge hole **151** according to an embodiment may include an inclined surface **152**. The inclined surface **152** may be formed on an inner wall surface of the filter discharge hole **151** and may be inclined toward the discharge outlet **120** such that the oil mist filter **513** is discharged toward the discharge outlet **120** when the oil mist filter **513** is discharged through the filter discharge hole **151**.

With this configuration, the oil mist filter **513** moved by being unwound from the filter roll **610** may be moved by being bent only in one direction, and thus, efficient movement of the oil mist filter **513** may be performed. Additionally, when the oil mist filter **513** is discharged to the upper side of the head **100**, the oil mist filter **513** may be discharged toward the discharge outlet **120** located at a side opposite to a burner, so accidents due to discharging of the oil mist filter **513** toward the burner may be prevented.

As illustrated in FIG. **27**, for example, the casing main body **140** according to an embodiment may include a first casing main body **140***a* and a second casing main body **140***b*. The first casing main body **140***a* according to this embodiment may be a major part of the casing main body **140** according to an embodiment. For example, the suction inlet **110** and the roll mounting portion **142** may be formed in the first casing main body **140***a*. Additionally, the first casing main body **140***a* may include flow space **141** formed therein to seat flow path **170** in the flow space **141** and may be coupled to the column **300**.

The second casing main body **140***b* according to an embodiment may be coupled to the first casing main body **140***a* by a vertical hinge. Accordingly, as illustrated in FIG. **27**, the second casing main body **140***b* may open and close the first casing main body **140***a* in a horizontal direction.

When the second casing main body **140***b* opens the first casing main body **140***a*, the filter transportation unit **620** installed in the casing main body **140** may be exposed to the

outside, as illustrated in FIG. **27**. Accordingly, after the second casing main body **140***b* is opened, the first roller unit **630** and the second roller unit **640** may be removed from the casing main body **140**, so that the first roller unit **630** and the second roller unit **640** used for a predetermined period of time may be washed.

The first moving roller **631** of the first roller unit **630** and the first moving roller **641** of the second roller unit **640** may be installed in the first casing main body **140***a*. Further, the second moving roller **632** of the first roller unit **630** and the second moving roller **642** of the second roller unit **640** may be installed in the second casing main body **140***b*. Accordingly, when the second casing main body **140***b* closes the first casing main body **140***a*, the oil mist filter **513** may be fitted between the first moving roller **631** or **641** and the second moving roller **632** or **642**, so that replacement of the filter roll **610** may be further efficiently performed.

FIGS. **28**A, **28**B, **28**C, **28**D, **29**A, **29**B, and **29**C are views illustrating a process in which a filter roll is newly mounted in a portable hood according to an embodiment. FIGS. **28**A, **28**B, **28**C, **28**D, **29**A, **29**B, and **29**C show only reference numerals necessary for description so that the configurations of the illustrated drawings may be more clearly identified.

Referring to FIGS. **28**A, **28**B, **28**C, **28**D, **29**A, **29**B, and **29**C, as illustrated in FIG. **28**A, in a state in which the portable hood **10** according to an embodiment is assembled, first, the upper casing **150** and the lower casing **160** may be removed from the casing main body **140**, as illustrated in FIG. **28**B. Next, as illustrated in FIG. **28**C, a front of the first casing main body **140***a* may be opened by rotating the second casing main body **140***b* relative to the first casing main body **140***a*. In this case, as described above, the first moving roller **631** or **641** is installed in the first casing main body **140***a*, and the second moving roller **632** or **642** is installed in the first casing main body **140***a*.

Next, as illustrated in FIG. **28**D, the filter roll **610** may be mounted to the roll mounting portion **142** formed at the lower surface of the first casing main body **140***a* according to the method described above. Next, as illustrated in FIG. **29**A, the oil mist filter **513** may be unwound by pulling the end of the oil mist filter **513** from the filter roll **610** mounted to the roll mounting portion **142** and may be bent at the front end of the first casing main body **140***a*, and as illustrated in FIG. **29**B, the oil mist filter **513** may be directed upward. In this case, a flat surface of a side of the oil mist filter **513** may be in close contact with the front of the first moving roller **631** or **641** installed in the first casing main body **140***a*.

Next, as illustrated in FIG. **29**C, when the front of the first casing main body **140***a* is closed by rotating the second casing main body **140***b*, the oil mist filter **513** may be located between the first moving roller **631** or **641** and the second moving roller **632** or **642** and may be held therebetween, with the end of the oil mist filter **513** exposed to the upper side of the casing main body **140**.

Next, when the upper casing **150** and the lower casing **160** are coupled to the casing main body **140**, as illustrated in FIG. **1**, installation of the oil mist filter **513** may be completed by exposing the end of the oil mist filter **513** to the upper side of the head **100**. In a process of coupling the upper casing **150** to the casing main body **140**, the coupling of the upper casing **150** to the casing main body **140** may be performed after passing the end of the oil mist filter **513** through the filter discharging hole **151**.

As another example, as for the process of coupling the lower casing **160** to the casing main body **140**, in a state illustrated in FIG. **29**B, the lower casing **160** may first be coupled to the first casing main body **140***a* and then the second casing main body **140***b* may be rotated.

In the embodiment described above, the filter unit **500** installed at the suction inlet **110** includes the deodorization filter **512**, the oil mist filter **513**, and the pre-filter **514**, which are made of a non-woven fabric, corrugated activated carbon, and aluminum mesh, respectively. This is because the portable hood **10** according to the above-described embodiment is suitable for removing oil vapor generated during cooking.

As another example, the portable hood **10** according to an embodiment may be configured to function as an air purifier. As described above, the deodorization filter **512** may be replaced through the suction inlet **171** of the casing main body **140**, and the oil mist filter **513** may be replaced through replacement of the filter roll **610**. Likewise, the pre-filter **514** may be detachably installed at the lower casing **160**.

For operation of the portable hood as an air purifier, a user may replace the deodorization filter **512**, the oil mist filter **513**, or the pre-filter **514** according to the embodiment described above with a filter suitable for air purification to be used, so that the scope of use of the portable hood **10** according to embodiments may expand.

For example, pre-filter **514** may be replaced with a plastic mesh filter suitable for the air purifier. Further, a HEPA filter and a deodorization filter may be installed sequentially at a position at which the deodorization filter **512** described above is installed. In this case, a user may use the portable hood as the air purifier with the oil mist filter **513** unremoved or removed.

Accordingly, embodiments disclosed herein have been made keeping in mind problems occurring in the related art, and are intended to propose a portable hood which is changeable in installation position.

Embodiments disclosed herein provide a portable hood which maintains a stable standing state to remove the possibility of tipping over during use such that stable cooking may be performed. Further, embodiments disclosed herein provide a portable hood that draws oil vapor generated during cooking thereinto at a position adjacent to an upper portion of a cooking utensil, such as a pot, such that efficiency of drawing the oil vapor is increased. Additionally, embodiments disclosed herein provide a portable hood in which a suction inlet is adjusted such that the suction inlet is placed above a cooking utensil according to a height or position of the cooking utensil.

Furthermore, embodiments disclosed herein provide a portable hood in which oil vapor is prevented from bypassing the suction inlet without being introduced to the suction inlet. Additionally, embodiments disclosed herein provide a portable hood in which oil vapor is introduced through the suction inlet and discharged upward such that the oil vapor is efficiently removed through cooperation of the portable hood with a fixed hood installed in a kitchen.

In addition, embodiments disclosed herein provide a portable hood in which main components are easily disassembled and then washed such that cleanliness of the main components is maintained. Further, embodiments disclosed herein provide a portable hood which in addition to a function of removing oil vapor during cooking, has an air cleaning function.

A portable hood according to embodiments disclosed herein may include a base unit or base, a head unit or head, a columnar unit or column, and a drawing-force generation part or fan. The base unit according to embodiments disclosed herein may sit on a foundation.

The head unit according to embodiments disclosed herein may introduce air thereto and may discharge the introduced air to the outside. The column according to embodiments disclosed herein may connect the head unit with the base unit such that the head unit is spaced upward apart from the base. The columnar unit may be coupled to the head unit to be biased to a horizontal side thereof.

The drawing-force generation part according to embodiments disclosed herein may be installed in the head unit and may generate a suction force. The drawing-force generation part may be located in the head such that the drawing-force generation part is biased to a horizontal side of the head to correspond to the column.

The head unit according to embodiments disclosed herein may include a suction inlet and a discharge outlet. Air may be introduced into the suction inlet according to embodiments disclosed herein, and the air introduced through the suction inlet may be discharged to the outside through the discharge outlet.

In embodiments disclosed herein, the suction inlet and the discharge outlet may be formed to be eccentric to each other in a horizontal direction relative to a vertical direction. The discharge outlet may be located to be biased in a direction toward the columnar unit from the suction inlet.

The columnar unit according to embodiments disclosed herein may be rotatably coupled to the base unit such that the suction inlet of the head unit is rotatable side to side in a horizontal direction.

The drawing-force generation part according to embodiments disclosed herein may be installed in the discharge outlet and may include a discharge fan configured to generate a suction force for introducing air to the discharge outlet. The discharge fan may be installed in the head unit such that the discharge fan is located at the upper side of the columnar unit.

In addition, the drawing-force generation part according to embodiments disclosed herein may further include a fan motor configured to rotate the discharge fan. The fan motor may be installed in the head unit such that the fan motor is located at the upper side of the columnar unit.

The discharge fan and a rotational shaft of the fan motor may be installed vertically, and the discharge fan and the fan motor may be installed in the head such that the rotational shaft of the fan motor is located inside of the columnar unit. The fan motor, the discharge fan, and the columnar unit may be installed such that the central axes of the fan motor, the discharge fan, and the columnar unit correspond to each other.

The head unit according to embodiments disclosed herein may include a head main body and a flow-path portion or flow path. The suction inlet and the discharge outlet may be formed in the head unit such that the suction inlet and the discharge outlet are eccentric to each other in a horizontal direction. Further, the flow-path portion may be provided inside of the head main body such that air introduced through the suction inlet flows to the discharge unit through the flow path.

The discharge fan and the fan motor may be vertically arranged with the flow-path portion placed between the discharge fan and the fan motor. The flow-path portion may include an inlet, a filter discharge hole, and an inner flow path. The inlet may be open toward the suction inlet, and the filter discharge hole may be open toward the discharge outlet. Additionally, the inner flow path may communicate the inlet with the filter discharge hole in a horizontal direction.

The inlet and the filter discharge hole may be formed in the flow-path portion such that the inlet and the filter discharge hole do not vertically overlap. The discharge fan and the fan motor may be installed in the head unit such that the discharge fan and the fan motor are located at upper and lower sides, respectively, of the filter discharge hole.

The columnar unit according to embodiments disclosed herein may be coupled to the base unit such that the columnar unit is horizontally eccentric to the base unit. In a short length direction of the horizontal cross-section of each of the base unit and the head unit, a width of the base unit may be equal to or wider than a width of the head unit.

The portable hood according to embodiments disclosed herein may further include a weight plate. The weight plate may be provided inside of the base unit and may prevent the columnar unit and the head unit from tipping over. The weight plate may be made of metal.

The portable hood according to embodiments disclosed herein may further include a battery module. The battery module may be installed inside of the columnar unit and may supply power required for operating the fan motor. The battery module may be installed at a lower side of the inside of the columnar unit. Each of a plurality of battery modules may be horizontally arranged inside of the columnar unit by standing.

The portable hood according to embodiments disclosed herein may have at least the following advantages.

First, in a state in which the column is coupled eccentrically to a side of the head in a horizontal direction, the fan may be located eccentrically to a side of the column, and a center of weight of the portable hood may be formed at the side of the column, thereby preventing tipping over of the portable hood.

Second, components, such as a weight plate and a battery module, may be arranged in the base or the column such that the center of weight of the portable hood is located at the column or a lower portion of the portable hood, thereby enabling stable standing of the portable hood such that the portable hood is prevented from tipping over.

Third, the suction inlet and the discharge outlet may be formed at eccentric positions in a horizontal direction, thereby removing bypassing of air occurring when the suction inlet and the discharge outlet are positioned on a same axis in a vertical direction and improving efficiency of drawing and discharging air.

Fourth, the suction inlet and the discharge outlet may be formed at eccentric positions in a horizontal direction, a flow of air introduced to the suction inlet and a flow of air discharged from the discharge outlet may not affect each other, thereby improving efficiency of drawing and discharging air.

Fifth, the head may be provided to rotate horizontally relative to the base, and the suction inlet may be adjusted to be located adjacently to an upper portion of a cooking utensil according to a cooking environment, such as a position of a burner being used. Accordingly, the portable hood may draw oil vapor thereto at the position adjacent to the upper portion of the cooking utensil, thereby increasing efficiency of drawing the oil vapor.

Sixth, the discharge outlet may be configured to discharge oil vapor in an upward direction, and the oil vapor may be discharged in a direction toward a fixed hood, thereby effectively removing the oil vapor generated during cooking in cooperation with the fixed hood.

Seventh, the fan motor configured to rotate the discharge fan may be located under a flow path in which oil vapor flows, thereby preventing contamination of the fan motor

due to the oil vapor. Further, due to prevention of the contamination of the fan motor, the fan motor may not be required to be disassembled during disassembly of the portable hood to wash the portable hood, thereby simplifying disassembling and washing of the portable hood.

Eighth, the head main body may be removed from the casing main body and the upper casing, and the flow path providing communication between the suction inlet and the discharge outlet may be removed from the casing main body, thereby enabling washing of the flow path in which the oil vapor flows.

Ninth, the fan housing receiving the discharge fan may protrude from the head, thereby slimming an entire vertical thickness of the head main body receiving the discharge fan and the fan motor.

Tenth, disassembly of the head may be easy, thereby facilitating washing and replacement of the discharge fan, the flow path, and a purification filter, such as a deodorization filter installed in the head.

Eleventh, the lower casing may be removed from the casing main body, thereby facilitating replacement of an oil mist filter provided as a roll filter through a hinged coupling between a first casing main body and a second casing main body.

Twelfth, an end of the oil mist filter discharged to the upper side of the head unit may be configured to be discharged to the discharge outlet located at a side opposite to a burner, thereby preventing accidents which may occur during discharge of the end of the oil mist filter to the burner.

Thirteenth, the head may be configured to have an adjustable height, thereby effectively drawing and discharging oil vapor according to cooking utensils having various heights without affecting cooking.

Fourteenth, the purification filter constituting the filter may be replaced, thereby functioning as an air purifier by replacing a purification filter used during cooking with the purification filter for air purification.

The embodiments have been described above with reference to the accompanying drawings, but the embodiments are not limited to the above embodiments and may be manufactured in various forms. Those skilled in the art to which the embodiments pertain will understand that the embodiments may be implemented in other specific forms without changing the technical spirit or essential features. Therefore, it should be understood that the embodiments described above are illustrative in all respects and not restrictive.

It will be understood that when an element or layer is referred to as being "on" another element or layer, the element or layer can be directly on another element or layer or intervening elements or layers. In contrast, when an element is referred to as being "directly on" another element or layer, there are no intervening elements or layers present. As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items.

It will be understood that, although the terms first, second, third, etc., may be used herein to describe various elements, components, regions, layers and/or sections, these elements, components, regions, layers and/or sections should not be limited by these terms. These terms are only used to distinguish one element, component, region, layer or section from another region, layer or section. Thus, a first element, component, region, layer or section could be termed a second element, component, region, layer or section without departing from the teachings of the present invention.

Spatially relative terms, such as "lower", "upper" and the like, may be used herein for ease of description to describe the relationship of one element or feature to another element(s) or feature(s) as illustrated in the figures. It will be understood that the spatially relative terms are intended to encompass different orientations of the device in use or operation, in addition to the orientation depicted in the figures. For example, if the device in the figures is turned over, elements described as "lower" relative to other elements or features would then be oriented "upper" relative to the other elements or features. Thus, the exemplary term "lower" can encompass both an orientation of above and below. The device may be otherwise oriented (rotated 90 degrees or at other orientations) and the spatially relative descriptors used herein interpreted accordingly.

The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the invention. As used herein, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

Embodiments are described herein with reference to cross-section illustrations that are schematic illustrations of idealized embodiments (and intermediate structures). As such, variations from the shapes of the illustrations as a result, for example, of manufacturing techniques and/or tolerances, are to be expected. Thus, embodiments should not be construed as limited to the particular shapes of regions illustrated herein but are to include deviations in shapes that result, for example, from manufacturing.

Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. It will be further understood that terms, such as those defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

Any reference in this specification to "one embodiment," "an embodiment," "example embodiment," etc., means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment. The appearances of such phrases in various places in the specification are not necessarily all referring to the same embodiment. Further, when a particular feature, structure, or characteristic is described in connection with any embodiment, it is submitted that it is within the purview of one skilled in the art to effect such feature, structure, or characteristic in connection with other ones of the embodiments.

Although embodiments have been described with reference to a number of illustrative embodiments thereof, it should be understood that numerous other modifications and embodiments can be devised by those skilled in the art that will fall within the spirit and scope of the principles of this disclosure. More particularly, various variations and modifications are possible in the component parts and/or arrangements of the subject combination arrangement within the scope of the disclosure, the drawings and the appended claims. In addition to variations and modifications in the component parts and/or arrangements, alternative uses will also be apparent to those skilled in the art.

What is claimed is:

1. A portable hood, comprising:
a base configured to sit on a foundation;
a head configured to introduce air thereinto and to discharge the introduced air to the outside;
a column that connects the head with the base such that the head is spaced upward apart from the base; and
a fan installed inside of the head and configured to generate a suction force, wherein the column is coupled to the head to be biased to a horizontal side thereof, and the fan is located inside of the head such that the fan is located above the column, wherein the head comprises:
a suction inlet through which air is introduced, and a discharge outlet through which air introduced through the suction inlet is discharged to the outside, and wherein the suction inlet and the discharge outlet are eccentric with respect to each other in a horizontal direction relative to a vertical direction, and the discharge outlet is biased toward the column from the suction inlet.

2. The portable hood of claim 1, wherein the column is rotatably coupled to the base such that the suction inlet of the head is rotatable side to side in the horizontal direction.

3. The portable hood of claim 2, wherein the fan comprises a discharge fan installed in the discharge outlet and configured to generate the suction force for introducing air thereinto, and wherein the discharge fan is installed in the head such that the discharge fan is located above the column.

4. The portable hood of claim 3, wherein the fan further comprises a fan motor configured to rotate the discharge fan, and wherein the fan motor is installed in the head such that the fan motor is located at an upper side of the column.

5. The portable hood of claim 4, wherein the discharge fan and a rotational shaft of the fan motor extend vertically, and wherein the discharge fan and the fan motor are installed in the head such that the rotational shaft of the fan motor is located inside of the column.

6. The portable hood of claim 5, wherein the fan motor, the discharge fan, and the column are installed such that central axes of the fan motor, the discharge fan, and the column correspond to each other.

7. The portable hood of claim 5, wherein the head further comprises:
a head main body configured such that the suction inlet and the discharge outlet are horizontally eccentric with respect to each other, and wherein a flow path is formed inside of the head main body such that the air introduced through the suction inlet flows to the discharge outlet through the flow path.

8. The portable hood of claim 7, wherein the discharge fan and the fan motor are vertically arranged with the flow path between the discharge fan and the fan motor.

9. The portable hood of claim 8, wherein the flow path comprises:
an inlet which is open downward toward the suction inlet;
a filter discharge hole which is open upward toward the discharge outlet; and
an inner flow path that provides communication between the inlet and the filter discharge hole.

10. The portable hood of claim 9, wherein the inlet and the filter discharge hole are formed in the flow path such that the inlet and the filter discharge hole do not vertically overlap each other.

11. The portable hood of claim 10, wherein the discharge fan and the fan motor are installed in the head such that the discharge fan and the fan motor are located at upper and lower sides, respectively, of the filter discharge hole.

12. The portable hood of claim 3, wherein the column is coupled to the base such that the column is horizontally eccentric to the base.

13. The portable hood of claim 11, wherein, in a shortest length direction of a horizontal cross-section of each of the base and the head, a width of the base is equal to or wider than a width of the head.

14. The portable hood of claim 12, further comprising:
a weight plate made of metal provided inside of the base, the weight plate preventing the column and the head from tipping over.

15. The portable hood of claim 3, further comprising:
a battery module installed inside of the column and configured to supply power required for operating a fan motor.

16. The portable hood of claim 15, wherein the battery module is installed at a lower portion of the column thereinside.

17. The portable hood of claim 15, wherein the battery module comprises a plurality of battery modules arranged horizontally inside of the column and standing up.

18. A portable hood, comprising:
a base;
a head configured to introduce air thereinto and to discharge the introduced air to the outside;
a column that connects the head with the base such that the head is spaced upward apart from the base, the column being rotatably coupled to the base such that a suction inlet of the head is laterally rotatable within a predetermined angle range; and
a fan installed inside of the head and configured to generate a suction force, wherein the column is coupled to the head at one end thereof in a longitudinal direction, and the fan is located inside of the head such that the fan is located above the column, wherein the head comprises:
a suction inlet through which air is introduced, and a discharge outlet through which air introduced through the suction inlet is discharged to the outside, and wherein the suction inlet and the discharge outlet are eccentric with respect to each other in a horizontal direction relative to a vertical direction, and the discharge outlet is biased toward the column from the suction inlet.

19. A portable hood, comprising:
a base;
a head configured to introduce air thereinto and to discharge the introduced air to the outside;
a column that connects the head with the base such that the head is spaced upward apart from the base, the column being rotatably coupled to the base such that a suction inlet of the head is laterally rotatable; and
a fan installed inside of the head and configured to generate a suction force, wherein the column is coupled to the head at one end thereof in a longitudinal direction, and the fan is located inside of the head such that the fan is located above the column, and wherein a lateral width of the base is equal to or wider than a lateral width of the head, wherein the head comprises:
a suction inlet through which air is introduced, and a discharge outlet through which air introduced through the suction inlet is discharged to the outside, and wherein the suction inlet and the discharge outlet are eccentric with respect to each other in a horizon-

tal direction relative to a vertical direction, and the discharge outlet is biased toward the column from the suction inlet.

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